MARINE REVIEW

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GREAT LAKES TOWING CO.

CONSOLIDATION OF HARBOR TUG INTERESTS ON THE LAKES IS A REALITY—A COMPANY MADE UP OF VESSEL OWNERS THROUGHOUT THE LAKE REGION OWNS THE TUGS.

The Great Lakes Towing Co., involving a consolidation of all the harbor tug interests of the lakes, and including the tugs of Buffalo, Erie, Conneaut, Ashtabula, Cleveland, Detroit, Port Huron and Duluth, as well as one of the two Chicago lines, is a reality. Practically, every tug that is wanted for the present, excepting the vessels of the Dunham Towing & Wrecking Co. of Chicago, has been purchased. The formal organization as to directors and officers is also outlined but not so fully decided upon as to admit of all the names being given out. The management will be under the direction of a board of fifteen, from which an executive committee of seven is to be selected. W. A. Collier of the Vessel Owners' Towing Co., Cleveland, will be general manager, and in that position will be the principal salaried officer and in fact the active head of the organization, as it is not the intention to have salaries of importance attached to any of the other offices. Gen. Geo. A. Garretson, banker of Cleveland, who has been very active among the syndicate managers engaged in buying the property, will very probably be treasurer of the company, and it is probable also that Mr. T. F. Newman of the Cleveland & Buffalo Transit Co., a member of the committee that appraised the tugs, will occupy an official position.

The syndicate managers, who have had charge of what is known as the underwriting of this affair, are Gen. Geo. A. Garretson, H. G. Dalton of Pickands, Mather & Co., W. G. Mather of the Cleveland-Cliffs Iron Co., James Davidson, ship builder and vessel owner of Bay City, A. B. Wolvin, vessel owner of Duluth, and Mr. T. F. Newman, secretary. It is more than probable that all these gentlemen will be represented in some capacity in the management, but mainly, of course, in the directory, and not in such an active way as to require salaries.

The members of the underwriting syndicate, who will be the stockholders of the company, are so thoroughly in control of the towing business of the lakes as vessel owners, that the fact of some tugs not being included as yet is causing no worry as to the success of the undertaking, and it is also confidently expected that within a very short period such of the wrecking plants as are not now included will be taken in, and the vessel owners (the company is one almost entirely of vessel owners) will then be doing their own wrecking as well as their own towing. Messrs. James H. Hoyt and Harvey D. Goulder have acted jointly as counsel in everything pertaining to the organization, and they have had a very large task, far great r than was expected. Still there is a general feeling of satisfaction, both on the part of all the interested vessel owners and the tug owners who have sold out, but who retain in all cases a stock interest in the new organization, and who have pledged themselves not to re-enter the business for a long period of years. There was no disposition to twist any of the towing companies in the negotiations. The tugs have been conservatively but fairly bought.

NEW IRON MINING PROPERTIES.

With the efforts that are being made in all parts of the Lake Superior country to find new ore properties and to develop others that were considered worthless only a few months ago, comes also the announcement of definite arrangements for the opening up of the new Atikokan range, which lies north and west of Lake Superior, fifty miles from the Vermillion range of Minnesota, and from which Canadian interests expect to derive great advantages. With a continuance of the present activity in steel and iron lines, it is more than probable that a great deal will be heard of this new iron mining region during the next few months, although it is fully understood, of course, that it is a district as yet far from the position of beginning shipments. The reports must be taken for what they are worth. One dispatch of recent date from Duluth is as follows:

"A party of wealthy ironmen has just closed an option for the fee to four miles of the strike of the Atikokan range, paying $10,000 cash at a bank in this city, and agreeing to pay $350,000 more at the conclusion of their investigations. In a few weeks they will have their men at work test-pitting and examining the ore. They will not do prospecting and exploration, for that is scarcely necessary where the iron ore rises 100 feet above the surrounding soil and can be traced for thousands of feet and at intervals for many miles, but they will examine to see whether or not the rich assays of the surface ore hold out, and if so they will begin mining as soon as possible. The existence of the Atikokan range has been known to a few persons for fifteen years, but nothing has been done toward its development. The lands on which an option has been obtained lie within half a mile of the Ontario & Rainy River Railway, which the Dominion government is now helping to build by giving it a grant of $10,400 to the mile, and which will be running along the Atikoka river within a year. The road will build ore docks at Fort William on Lake Superior, and the ore from these mines will be shipped to furnaces in the United States, which can be done free of import duty if the product be exported. It is the intention of the buyers to use the entire ore supply from this region to build up an export trade in steel. Assays made at various times by the Canadian Geological Survey, the Minnesota Iron Co., the Carnegie Steel Co. and others, show this ore to be from 64 to 68 per cent in iron and as low as .030 in phosphorus, making it an ideal Bessemer ore. It is said that there are 2,000,000 tons of ore in sight at the present time, without one stroke of development work ever having been done. Recent reports of experts say that the ore may be mined and put on cars at from 40 to 50 cents a ton. It can be dropped by side cuts directly into cars on tracks beside the outcrops."

WILL APPROACH TWENTY-THREE MILLIONS.

TOTAL MOVEMENT OF FREIGHT TO AND FROM LAKE SUPERIOR IN 1899—HEAVY SHIPMENTS OF WHEAT—COAL SHORTAGE.

It is more than probable that the movement of freight of all kinds to and from Lake Superior during the present season will be close to twenty-three million net tons. The aggregate for 1898 was 21,234,664 net tons. Reports from both canals at the Sault to the first of August this year show a total movement of 10,433,875 tons, against 9,568,599 tons on the same date last year, and only 7,872,695 tons on Aug. 1, 1897. The principal gain this year is in wheat moving eastward from the head of Lake Superior. The wheat movement to August 1 aggregates 21,076,558 bushels, as compared with 10,101,450 bushels on the same date in 1898. The shortage in bituminous coal moved through the canals is not as large as was expected. The figures are 1,227,038 net tons to Aug. 1 this year, compared with 1,630,568 tons on Aug. 1, 1898, or a shortage of 403,530 tons. Of anthracite coal there was moved through the canals to Aug. 1 of this year 392,523 tons. On Aug. 1, 1898, the movement of anthracite aggregated only 193,535 tons. Following is a full summary of the canal statistics:

MOVEMENT OF PRINCIPAL ITEMS OF FREIGHT TO AND FROM LAKE SUPERIOR.

ITEMS.	To Aug. 1, 1899.	To Aug. 1, 1898.	To Aug. 1, 1897.
Coal, anthracite, net tons	392,523	193,535	172,477
Coal, bituminous, net tons	1,227,038	1,630,568	958,377
Iron ore, net tons	6,474,735	5,778,122	4,518,716
Wheat, bushels	21,076,558	10,101,450	19,771,947
Flour, barrels	2,570,858	2,553,253	3,504,952

REPORT OF FREIGHT AND PASSENGER TRAFFIC TO AND FROM LAKE SUPERIOR, FROM OPENING OF NAVIGATION TO AUGUST 1 OF EACH YEAR FOR THREE YEARS PAST.

EAST BOUND.

ITEMS.	Designation.	To Aug. 1, 1899.	To Aug. 1, 1898.	To Aug. 1, 1897.
Copper	Net tons	45,343	62,246	64,819
Grain	Bushels	13,841,379	12,206,691	10,581,613
Building stone	Net tons	12,655	3,537	2,378
Flour	Barrels	2,570,858	2,552,353	3,504,702
Iron ore	Net tons	6,474,735	5,778,122	4,518,716
Iron, pig	Net tons	13,319	18,032	3,666
Lumber	M. ft. b. m.	421,210	383,117	346,095
Silver ore	Net tons	.....	.....	5
Wheat	Bushels	21,076,558	10,101,450	19,771,947
Unclassified freight	Net tons	71,697	111,292	125,365
Passengers	Number	10,271	8,393	7,715

WEST BOUND.

Coal, anthracite	Net tons	392,523	193,535	172,477
Coal, bituminous	Net tons	1,227,038	1,630,568	958,377
Flour	Barrels	.....	902	250
Grain	Bushels	14,500	4,815	.....
Manufactured iron	Net tons	57,246	119,126	50,690
Salt	Barrels	158,419	143,341	103,218
Unclassified freight	Net tons	185,560	180,823	162,807
Passengers	Number	12,053	10,474	8,908

SUMMARY OF TOTAL FREIGHT MOVEMENT IN TONS.

	To Aug. 1, 1899.	To Aug. 1, 1898.	To Aug. 1, 1897.
East bound freight of all kinds, net tons	8,547,607	7,422,495	6,502,748
West bound freight of all kinds, net tons	1,886,268	2,146,104	1,369,947
	10,433,875	9,568.599	7,872,695

Total number of vessel passages to Aug. 1, 1899, was 8,599 and the registered tonnage 9,266,163.

The business of the late S. M. Shimer, in old material, pig iron, ore, etc., will be continued at 304-6 Perry-Payne building, Cleveland, by the S. M. Shimer Co., which has been incorporated the past week. The officers are: S. W. Croxton, president; H. W. Haggerty, secretary and general manager; I. D. Lafferty, treasurer; L. G. Stockwell, assistant secretary. The directors are S. W. Croxton, John N. M. Shimer, H. W. Haggerty, W. P. Johnson and I. D. Lafferty.

PORTSMOUTH DRY DOCK.

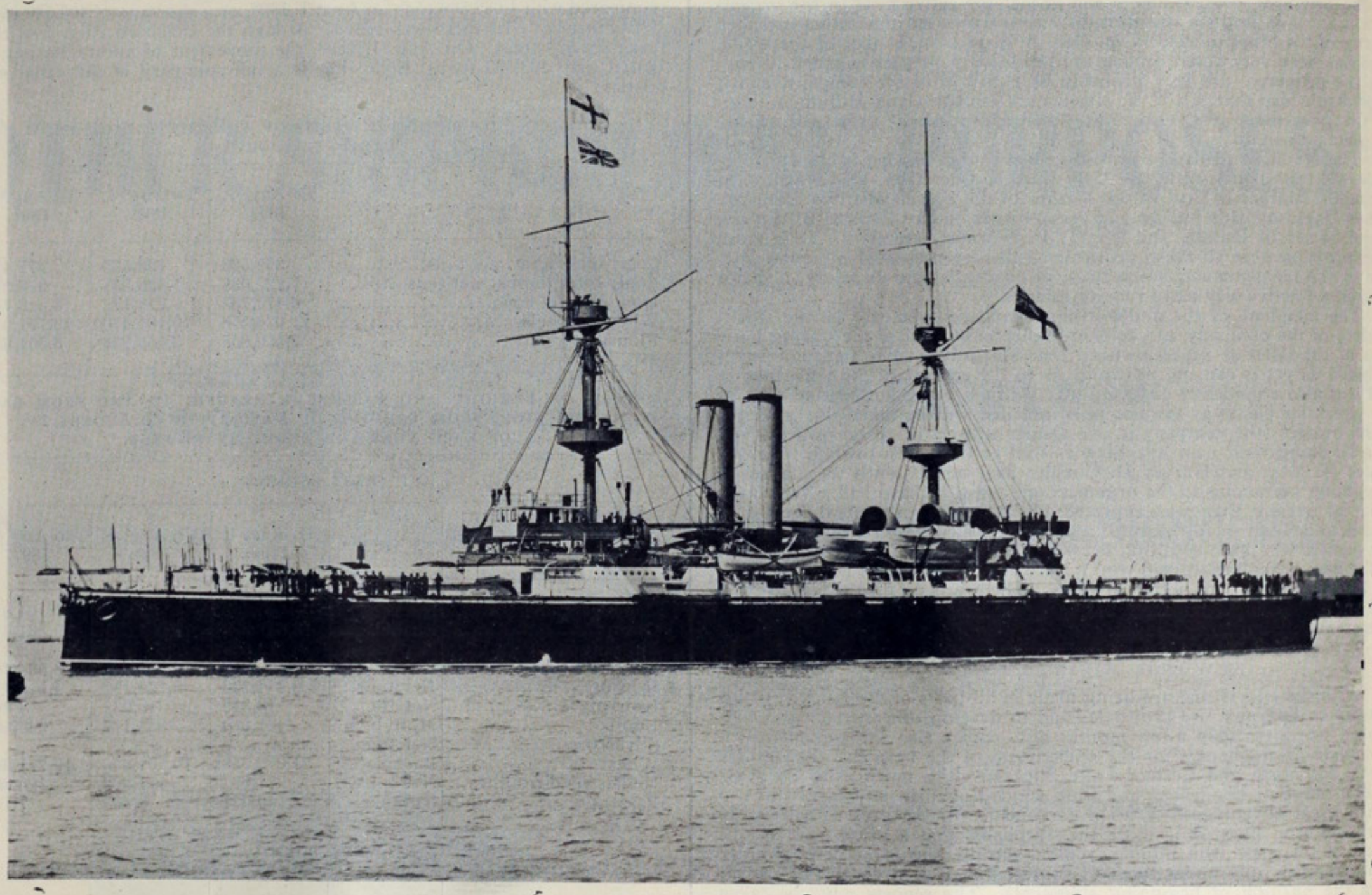
SPECIFICATIONS ISSUED FOR THE STONE AND CONCRETE STRUCTURE TO BE BUILT AT THE NEW HAMPSHIRE NAVY YARD—OF DIMENSIONS EQUAL TO THE LARGEST SHIP IN THE WORLD.

Specifications have been issued by the bureau of yards and docks, navy department, for the new stone dry dock to be built at Portsmouth, (N. H.) navy yard, and they evidence the fact that it will be one of the finest structures of this character in the possession of the department. The general dimensions of the dock will be as follows: Length on coping from head to outer gate sill, 750 feet; length on floor from head to outer gate sill, 725 feet; width on coping in body, 130 feet; width on floor in body, 80 feet; width on coping at abutment, least, 101 feet 9 inches; width at entrance on mean high water level, 100 feet; depth from coping to mean high water, 5 feet 3 inches; greatest depth from coping to floor in body, 39 feet 3 inches; draught over sill at mean high water, 30 feet.

The dock will be built of concrete and stone masonry and the rock foundation must be properly excavated to allow the stone lining to be set with at least 18 inches of concrete between the nearest part of the rock to the stone lining and the lining itself. The main pumps, three in number, and the drainage pump are to be of the centrifugal type, balanced and driven by direct-connected electric motors. The generating sets, three in number, will consist of vertical compound engines with two dynamos direct connected to each engine. Engines are to be of 450 indicated horse power and are to have a speed of 200 revolutions. Steam will be supplied from six water tube boilers set in three batteries, and two feed water heaters and two feed pumps will be provided. Each boiler is to be of not less than 200 nominal horse power and is to have 2,000 square feet of heating surface and 40 square feet of grate surface. The equipment will include eight electric capstans of the Providence improved type, manufactured by the American Ship Windlass Co. of Providence, R. I., and three electric winches each capable of lifting 20,000 pounds 15 feet per minute. The boiler and pump houses and well are to be of brick, stone and concrete masonry. The boiler house is to be 50 by 21 feet in size. The steel caisson will be 104 feet in length, 22 feet breadth, and 36 feet depth from bottom of the keel to underside of upper deck at the side.

The dock is to be located partly in the channel separating the navy yard proper from Seavey's island. The dock will be excavated chiefly in rock, the excavation lined with concrete and faced with granite masonry. The portions of the side structure which are above the level of the rock excavation will be built up in the form of a concrete wall, faced, as in all the interior of the dock, with granite. In general dimensions the dock will be very similar to that now under construction at the Boston navy yard, although it is somewhat wider at the top and the interior arrangement is, in the opinion of the bureau officials, a considerable improvement upon that at Boston. The sides have an easy slope and the altars an easy rise. Chief Mordecai D. Endicott of the bureau of yards and docks says that he does not know of a dock the appointments of which will be equal to those at Portsmouth. All the metal work connected with the bilge blocks—racks, pawls, fastenings, chains, blocks, etc.—will be of composition metal. While the dock is constructed with altars or steps upon the sides, many of these are so high that the construction does not afford in itself a stairway from top to bottom, and stairs are introduced at convenient intervals along the sides of the dock. These, also, are made of composition, as well as the timber slide frames. This metal is adopted because it is not subject to corrosion and failure, and being free from rust, does not stain and discolor the masonry, which will be a very handsome piece of work.

The caisson, or gate, at the entrance of the dock is to be of steel of the best construction and well equipped with pumping apparatus for exhausting water when it is uplifted, and with steam capstans for handling it. The dock will also have at intervals, at convenient distances back from the coping, electric power capstans for handling ships in and out of the dock. The pumping apparatus, of powerful centrifugal kind, will be located near the dock in a handsome granite building. The pumps will be driven by electric power, which is to be generated at the new electric power station to be constructed upon the site of the old ship house, which is to be removed. Provision has been made for substantial quay walls for approaches to the entrance to the dock, which are to be a separate item in the bid, so that if the aggregate cost of the work should exceed the appropriation, they can be omitted and built subsequently. The dock is more expensive in some of is appointments than the one to be built at Boston, but as the site is upon rock, most of the construction is effected by simply lining the rock excavation, thereby reducing very largely the amount of concrete to be used. It is expected that this saving will very much more than offset the increased cost of excavating rock over that of earth excavation. The dock will be deep enough and large enough to take the largest battleship in the navy with perfect ease, and, in fact, it would receive any battleship in the world today.



A SHIP OF THE RESOLUTION CLASS, BRITISH NAVY.

ENTERPRISE OF THE FORE RIVER ENGINE WORKS.

The Fore River Engine Works of Weymouth, Mass., has just secured from the United States light-house board the contract for the new steel light vessel No. 72. The contract price is in the neighborhood of $70,000. The enterprise of the Fore River concern is evidenced by the fact that like the William R. Trigg Co. of Richmond, Va., it has engaged draughtsmen from the bureau of construction and repair, navy department, to prepare designs for the new 3,000 ton cruisers of the Denver class, for which bids will be opened in November, and in which competition both firms will submit bids. The senior class of the United States naval academy, which is now on a cruise on the training ship Annapolis, recently paid a visit to the Weymouth ship building plant. The party inspected the torpedo boat destroyers building at the yard and the officers manifested especial interest in the electrical boring machines and the galvanizing shop.

British shipping circles are still disturbed over the successful floating of the steamers China and Paris by foreign salvors after all home appliances had proven totally inadequate for the work. It is now stated that two British salvage companies, established on thoroughly up-to-date lines, will soon enter the field.

STEAMER JESSE SPALDING.

A STEEL LUMBER CARRIER RECENTLY LAUNCHED AT THE WHEELER SHIP YARD, WEST BAY CITY, MICH.

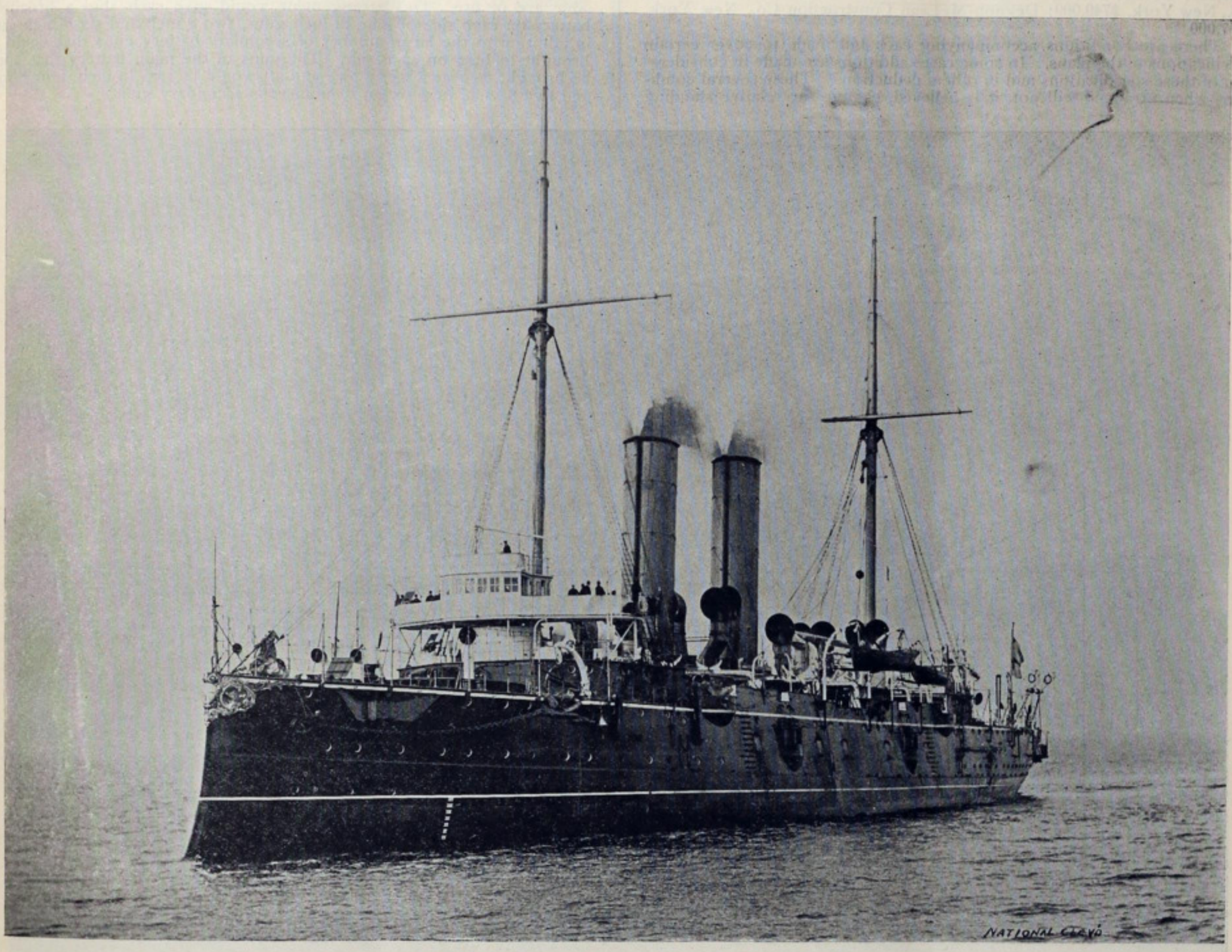
The steel steamer Jesse Spalding, launched at the Wheeler ship yard, West Bay City, Mich., on Saturday, July 29, is building to the order of the Spalding Lumber Co. of Chicago, Ill.,and will engage in the lumber trade between Lake Superior and Lake Michigan ports. Although a comparatively small vessel, the Jesse Spalding embodies the best modern practice in ship building. She was built to meet the highest requirements of the Bureau Veritas and in most cases these requirements have been greatly exceeded. Undoubtedly this boat is one of the strongest ever put afloat on the great lakes.

The general dimensions of the vessel are: Length over all, 236 feet; length of keel, 220 feet; beam, moulded, 40 feet; depth, moulded, 16 feet. She is fitted with a double bottom, 3 feet deep, extending from the collision bulkhead to after peak bulkhead, giving a capacity of about 500 tons of water ballast. The scantlings are as follows: Keel, 36 inches x 25 pounds; bottom plating, 18 pounds; bilge, 20 pounds, and sheer strake, 46 inches x 25 pounds. The floors are of channels, 15 inches x 33 pounds, spaced 24 inches apart. There are three longitudinal girders on each side of center vertical keelson, 15 pounds per foot, the middle one extending down between floors and connected to bottom plating. All bracket plates in the water bottom are 15 pounds per square foot. The inner bottom plating is 17½ pounds and 20 pounds with a margin plate of 15 pounds. The main frames are of channel, 6 inches x 13½ pounds, spaced 24-inch centers; web frames 15 inches x 33 pounds. Channels are spaced every 8 feet. The main deck beams are also of channels and are 10 inches x 25 pounds, spaced every four feet. There are steel bulwarks 3 feet 6 inches high extending from the after end of the forecastle to the forward end of the poop. Freeing ports of large area are fitted in the bulwarks to free the deck of water. There is a hold stringer running the entire length of the vessel, composed of 9 inch x 20 pounds channel, and intercostaled to the shell plating by flanged plate chocks of 15 pounds per square foot. The usual diamond-plate connection is fitted at the junction of the hold stringer and web frames. The hold stanchions are of I sections, 17 pounds per square foot, fitted to every beam. Under the boilers, which are located on the main deck, are three complete rows of stanchions.

There are five hatches, all spaced 24 feet centers. The rudder is of the usual balanced type with the exception that it is of cast steel and made solid. The rudder stock is also of cast steel, and is connected with the rudder proper by a suitable coupling. The motive power consists of a triple expansion engine with cylinders of 17, 28 and 47 inches diameter and 36 inches stroke. The boilers are of the Scotch type and are 11 feet diameter by 12 feet long. Cabin work is of the usual style for this class of vessel, the captain's, mate's, watchmen and wheelmen's rooms being located forward, and engineer's and steward's, aft. The firemen and deck hands are located on the main deck aft of the engine room bulkhead.

The equipment consists of a steam capstan windlass forward and steam capstan aft, made by the American Ship Windlass Co. The steam steerer was made by Williamson Bros. of Philadelphia. There is also a patent snubbing outfit located on the forecastle deck just abreast of the pilot house. The two pole spars are fitted as derricks for hoisting square timber, and conveniently placed to same are two hoisting engines. The electric plant, supplied by the General Electric Co., is complete in every particular, including a powerful search light. A notable feature in the wiring of this vessel is that all wire is run through steel tubes or conduits, instead of the usual wooden mouldings, and junction boxes are of cast iron.

The steamer is nearly completed, and will leave the yard sometime this week for Duluth. Her capacity will be 1,500,000 feet of lumber on 13 feet draught, or 75,000 bushels of wheat at the same draught.



CRUISER GIBRALTAR OF THE BRITISH NAVY

BUILDING VESSELS UNDER COVER.

Bath, Me., August 8.—The large brick and steel machine shop building at the plant of the Bath Iron Works in this city will, it is said, be the finest of its kind in the world. The company has also recently built three-story joiner and pattern shop and a handsome brick office building. The Bath Iron Works is the only large firm in the country which builds under cover vessels of the kind that require special care in construction, such as steam yachts and torpedo boats. They have an excellent steel yacht house, 315 by 52 feet, and all torpedo boats are built in an inclosed house 200 by 60 feet in size. The whole plant is the embodiment of a careful compact arrangement and the machinery equipment is unexcelled.

It is understood that Rear Admiral Hichborn of the bureau of construction and repair, navy department, will ask congress for a deficiency appropriation of $3,000,000 for the repair of vessels of the navy. Last year the bureau expended $10,000,000 on repair work and probably three-fourths of that sum will be required for similar work by July 1, 1900.

WASHINGTON NAVAL AFFAIRS.

BIDS ON THE CONSTRUCTION OF THE LEAGUE ISLAND DRY DOCK—HEAVIEST BATTERIES EVER CARRIED BY A SHIP OF WAR ARE PROPOSED FOR THE NEW BATTLESHIPS.

WASHINGTON BUREAU, MARINE REVIEW, 1345 PENNSYLVANIA AVENUE, WASHINGTON, D. C., AUGUST 10, 1899.

Bids were opened at the navy department, a day or two ago, in the office of Rear-Admiral Endicott, chief of the bureau of yards and docks, for the construction of a wooden dry dock at League island. There were seven bidders, whose bids varied from $1,320,000 to $749,000, the latter being the lowest. This bid came from the Atlantic, Gulf & Pacific Co. of New York, a responsible concern, which has the contract for the construction of the dry dock at Mare island, California. It is probable that this company will be awarded the contract for League island also. Following is a list of the bidders and the amounts: Farrell & Hopper, New York, $1,182,600; McGaw & Rosevelt, Philadelphia, $1,220,000; McIlvain, Unkeper & Co., Pittsburg, $1,143,589.84; Curtis & Driscoll, Springfield, Mass., $750,000; George Pierce, Bangor, Me., $949,973; Atlantic, Gulf & Pacific Co., New York, $749,000; Degnon-McLean Construction Co., New York, $957,000.

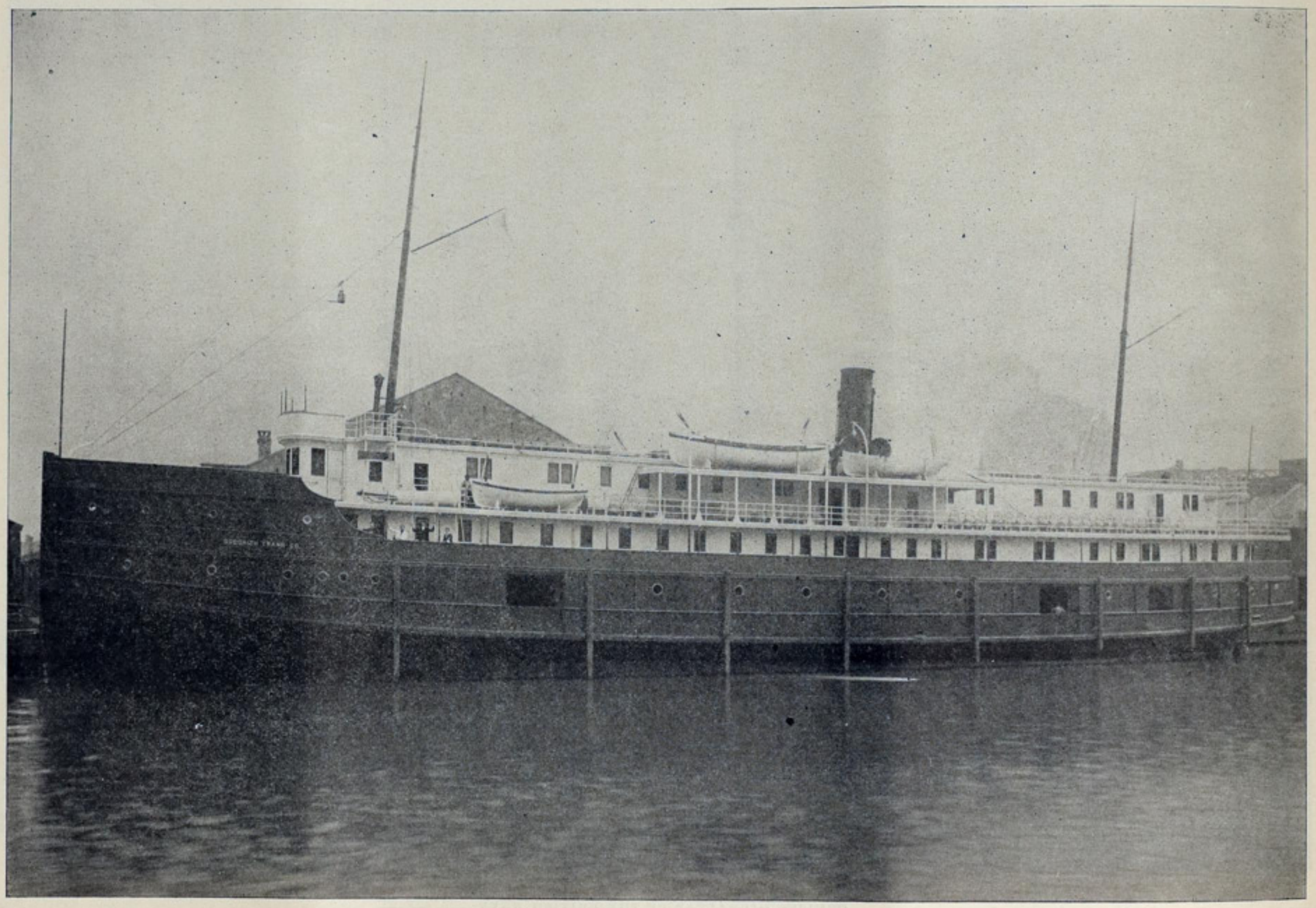
There are conditions accompanying each bid made to cover certain specifications of the plans. In some cases additions are made in consideration of these specifications and in others deductions. These several conditions when arranged will not, it is believed, change the relative standing of the bidders. It will require several days to schedule the bids and examine them in accordance with the attached conditions. All the bidders understand that there is a strong probability that legislation will be secured at the approaching session of congress by which authority will be granted to construct the dock of concrete or stone and the bids were made in accordance with that understanding.

Rear Admiral Endicott, who is the most earnest advocate of stone or concrete docks and who is convinced that the construction of a wood dock at League island would be an expensive blunder, is thoroughly convinced that if the matter be persistently urged upon congress by the representatives most directly concerned in building up League island as a naval station of the first class, the change will be authorized. It is certain that Rear Admiral Endicott in his annual report to the secretary of the navy will urge the importance and the imperative necessity for discarding wood in the construction of dry docks and substituting more endurable materials. It is equally certain that the secretary will present the matter to congress with a strong indorsement of the recommendation of Rear Admiral Endicott.

The general dimensions of the League island dock are: Length over all, 750 feet; width on top, 144 feet; width on floor, 80 feet; entrance width, 101 feet; depth from top to floor, 40 feet; draft at mean high water, 30 feet. These dimensions will make the dock of sufficient size to accommodate the largest battleships in the navy.

The heaviest batteries yet placed on any naval vessel in the world will be carried by the Georgia, New Jersey and Pennsylvania, the new battleships authorized by the last congress, if the suggestion of Rear Admiral O'Neil, chief of the bureau of ordnance, are adopted. These ships are to have an approximate displacement of 13,500 tons each and speed and coal capacity enabling them to be classed almost as armored cruisers. By the lightening of the armor belt made possible by the greatly increased resisting power of the latest armor, Rear Admiral O'Neil is enabled to plan much heavier batteries. He has prepared five separate plans for the new ships. Each provides for the same number of guns of each calibre in the secondary batteries and the same general arrangement, but modified by differences in the main batteries. In the secondary battery each vessel is to carry sixteen 3-inch guns, thirty calibre in length; sixteen three-pounders, four automatic one-pounders, six single shot one-pounders, ten machine guns and two field guns.

In the main batteries one plan contemplates four 12-inch guns of forty calibre, four 8-inch guns of forty-five calibre and twelve 6-inch guns of fifty calibre. The 12-inch guns are to be mounted in barbette turrets fore-and-aft of the superstructure, two 8-inch guns in a barbette turret on each beam and the 6-inch guns in broadside, so as to give the largest possible arc of fire. This arrangement would give each ship a broadside battery on each side of four 12-inch guns, two 8-inch and six 6-inch guns in addition to the large number of secondary-battery guns that could be brought to bear on each side. The guns of the main battery that could be brought to bear directly fore-and-aft would be two 12-inch, four 8-inch and two 6-inch, in addition to numerous secondary guns.



THE INDIANA, ONE OF THE PASSENGER STEAMERS OF THE GOODRICH TRANSPORTATION CO., OPERATING ON LAKE MICHIGAN.

The second plan differs from the first, in that it provides for eight 8-inch guns arranged in four barbette turrets, two on each side. There are two other plans identical with this, except that one proposes to substitute four 10-inch guns for the 12-inch, and the other proposes to substitute two 10-inch and two 12-inch for the four 12-inch guns. In these plans the fore-and-aft fire is the same as in the first plan but the broadside fire is increased by two 8-inch guns. The fifth plan differs from the first in having no 8-inch guns and increasing the number of 6-inch guns to sixteen, eight firing on each broadside and four directly forward and two directly aft.

The plan that will probably meet with favor, if it is found to be practicable to carry it within the limit of weights ultimately assigned to the battery, is that of the four 12-inch guns and eight 8-inch. The 8-inch gun is, of course, greatly favored by navy men, and proved its value in the Spanish war. It can be fired with rapidity and accuracy and is very destructive against light or even medium weight armor.

Rear Admiral O'Neil's suggestions contemplate the use of armor as light as is consistent with good practice. The water line belt, to extend the entire length of the ship, is to be 9 inches thick along the vital portions and will taper to 4 inches fore-and-aft of the main batteries. Diagonal armor 9 inches thick is to run from the side armor to the main barbettes. The armor is to be much more generally distributed, and the smaller guns of both the main and secondary batteries are to be given much better protection than in any battleship previously designed.

DISADVANTAGES OF UNREST AMONG LABOR.

As in all other industrial lines just now, the vessel interests of the great lakes are meeting with demands from labor for better wages, but there has been no trouble aboard the vessels as yet, and it is hoped that wages for the balance of the season will be so adjusted as to insure steady operation of the entire lake fleet. The question of an advance in wages is now in the hands of a committee of the Lake Carriers' Association, and some action on this score will very probably be taken on the 15th inst. Higher wages than are now being paid are assured for all employes on the ships, from second mates down to deck hands, but the advance is not as yet fully decided upon. Some of the newspapers have contained sensational articles regarding the demands of engineers aboard the vessels, but the vessel owners say they have heard nothing from the engineers further than a letter from National President Geo. Uhler of the Marine Engineers' Beneficial Association, which has already been referred to. In this letter Mr. Uhler raises the point that the factor in the adjustment of wages on the lakes is generally understood to be the prevailing or anticipated rates of freight, and that a depression in the market has generally carried with it a consequent decrease in wages of engineers employed on association vessels; but improved conditions and an improved general outlook has not brought about, he says, the advance that might be expected, as against the opposite rule on declining freights. Mr. Uhler claims that there is more dissatisfaction existing today from this cause than he has ever known to prevail. There has been no official action regarding this communication. Vessel owners who have referred to it say they have heard nothing from the engineers themselves and are unwilling to advance an opinion as yet regarding engineers' wages for the balance of the season. One answer they make to Mr. Uhler's claims is that engineers' wages were advanced in the spring, and that notwithstanding the high freights now prevailing, the great bulk of vessel tonnage is still engaged on ore contracts at low figures, on which the spring wages were based.

On the ore docks at Lake Erie ports the conditions as to labor are very unsatisfactory, and a great many annoyances are put up with that would not be tolerated if it were not for a disposition on the part of the dock managers and the vessel owners, who are also affected, to submit to a certain degree of loss in order to ward off serious trouble. When differences arose on account of the claims of the ore shovelers that advanced prices should be paid on certain grades of ore because of their physical structure, and on some vessels because of improper trimming, the following rule was submitted:

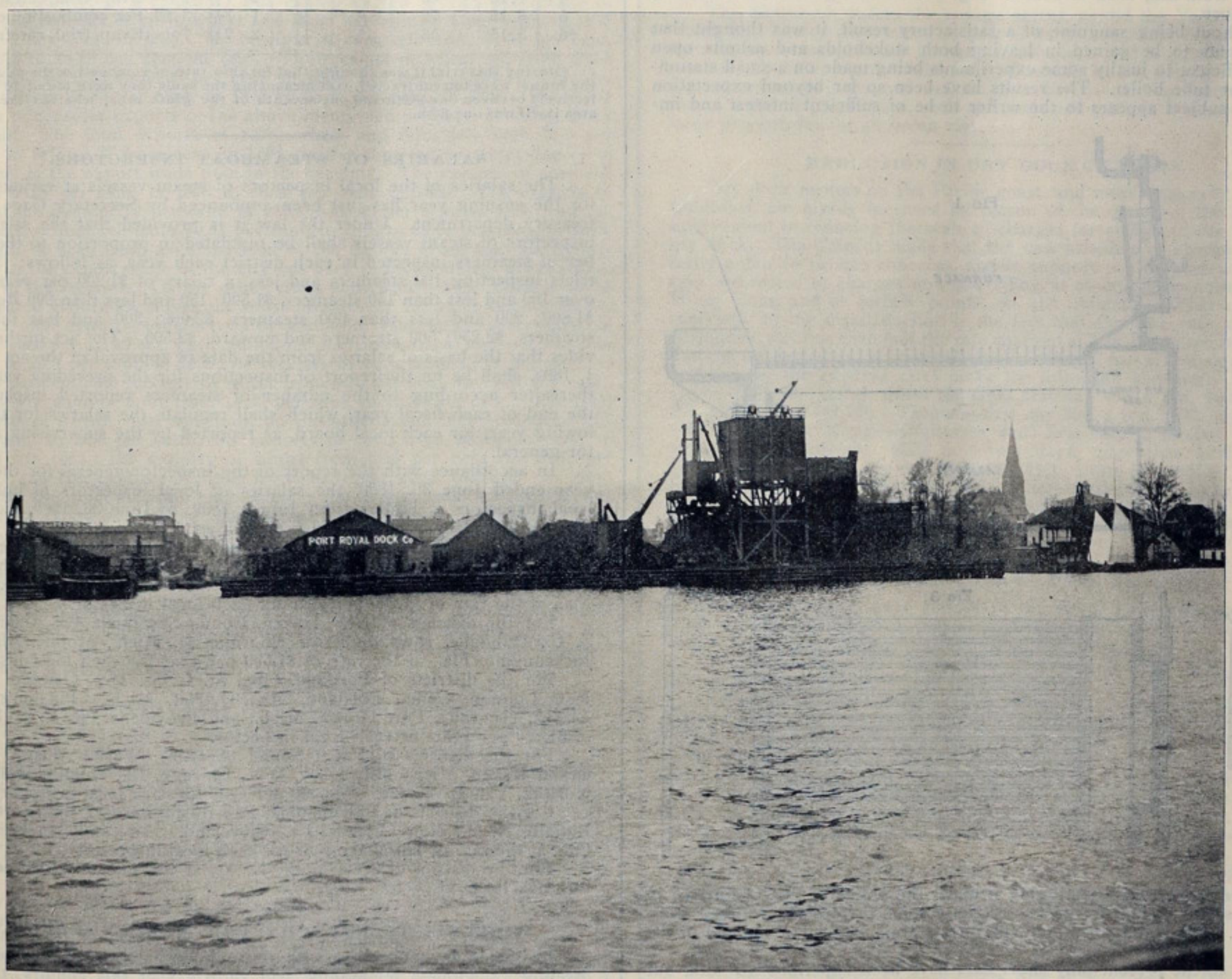
"There shall be no discrimination in the unloading price against any particular grade of ore because of its physical structure, whether soft ore, crushed or uncrushed hard ore, or bulky silicious ore, but where boats with untrimmed cargoes are offered for unloading and all or parts of cargoes are in bad shape, there shall be extra pay at the rate of not over 2½ cents per ton for the ore in hatches pronounced to be in bad condition. The hatches for which such extra compensation shall be granted shall be determined by a standing dock committee, to consist of the superintendent or foreman in charge of the dock at which the vessel may arrive and a representative of the shoveling gangs to be appointed by them, and in case an agreement cannot be reached a third disinterested party shall be chosen by the two and his decision shall be final. The tonnage upon which the extra compensation shall be allowed shall be the tonnage loaded in those hatches pronounced to be in bad condition as shown by the loading records of the vessels. In case of disagreement regarding the condition of any particular cargo, there shall be no suspension of work on any vessel besides the one in dispute and all other work at the dock shall continue uninterruptedly while the disputed case is being arbitrated."

Now it is claimed that this agreement, or whatever it may be called, is not being lived up to, and there are cases where vessel owners, rather than submit to delays, have paid extra charges when they felt they were being dealt with in a very unfair way.

THE WEST BAY CITY SHIP YARD.

West Bay City, Mich., Aug. 8.—With the completion of the lumber steamer Jesse Spalding, the Wheeler ship yard has passed entirely to the control of the American Ship Building Co., and everybody is wondering what is to be done with the plant. Mr. John McGinnis, representing the Cleveland management of the consolidated yards, arrived here a few days ago with credentials giving him charge of the works. It is understood that Mr. McGinnis has held an important place in the Globe works of Cleveland for a long time past and is so well acquainted with all the details of a ship yard that he can either wind up the affairs of this yard or continue it as the management of the consolidation may direct. If he has any knowledge as to plans regarding the future of the yard, he has managed to keep it to himself, and has quietly entered upon certain office work, probably preparatory to an inventory.

The people of this place would, of course, be greatly disappointed if the consolidation should conclude to remove the works. Mr. Jeffrey, the general superintendent since Mr. Wheeler secured possession a second time, says the yard can certainly be made to hold its own under proper management with other yards around the lakes. His claims are based mainly on labor advantages. The yard is especially fortunate, he says, in having so many skilled laborers in the steel ship building line who have built up homes here, and in having the call also on a great deal of ordinary labor at low wages, due to reduced costs of living, especially during the winter period. The work of constructing this last boat, the Jesse Spalding, is said to have been especially successful from a cost standpoint. About 70 per cent of it was piece work.



SCENE ON ST. MARY'S RIVER, MICH., JUST BELOW THE LOCKS OF THE U. S. GOVERNMENT CANAL. STEAMBOAT FUEL DOCKS OF THE PORT ROYAL DOCK CO

NEW SYSTEM OF FORCED DRAFT.*

DESCRIBED IN A PAPER READ AT A RECENT MEETING OF THE INSTITUTION OF NAVAL ARCHITECTS—FIREBARS UTILIZED AS A MEANS OF FORCING THE AIR INTO THE FIRE.

BY MR. NELSON FOLEY.

The writer has called the system about to be described new, believing it to be original, and, up to the present, untried, except by himself; but he is naturally open to correction, should such not prove to be the case. The fundamental principle of the system is that the fire bars themselves are utilized as a means of forcing the air into the fire. In order to accomplish this, these bars are made hollow, and are perforated with a row of small holes along each side near the upper surface, the holes being placed at such an angle that the air is forced in jets into the fire through the ordinary spaces between the bars. The front ends of the bars are inserted into a box or canal under the fire door, which is in communication with a fan, as shown in Figs. 1 and 3.

Fig. 2 shows a section of some of the bars as designed for an experimental trial. It will be observed that the holes are at such an angle as not only to direct the air up among the fuel, but also to induce, by means of the jets, a draft from the ashpits. The top part of the bar is made umbrella fashion, so that the holes may have protection as far as possible from ash, dust, or scoria. Fig. 4 is an enlarged section, showing this feature.

Without being sanguine of a satisfactory result, it was thought that the benefits to be gained in leaving both stokeholds and ashpits open were sufficient to justify some experiments being made on a small stationary water tube boiler. The results have been so far beyond expectation that the subject appears to the writer to be of sufficient interest and importance to warrant his bringing it under the notice of the institution; in fact, it seems to him to bid fair to cause some revolution in forced combustion. The results of these experiments are appended at the end of the paper.

FIG 1

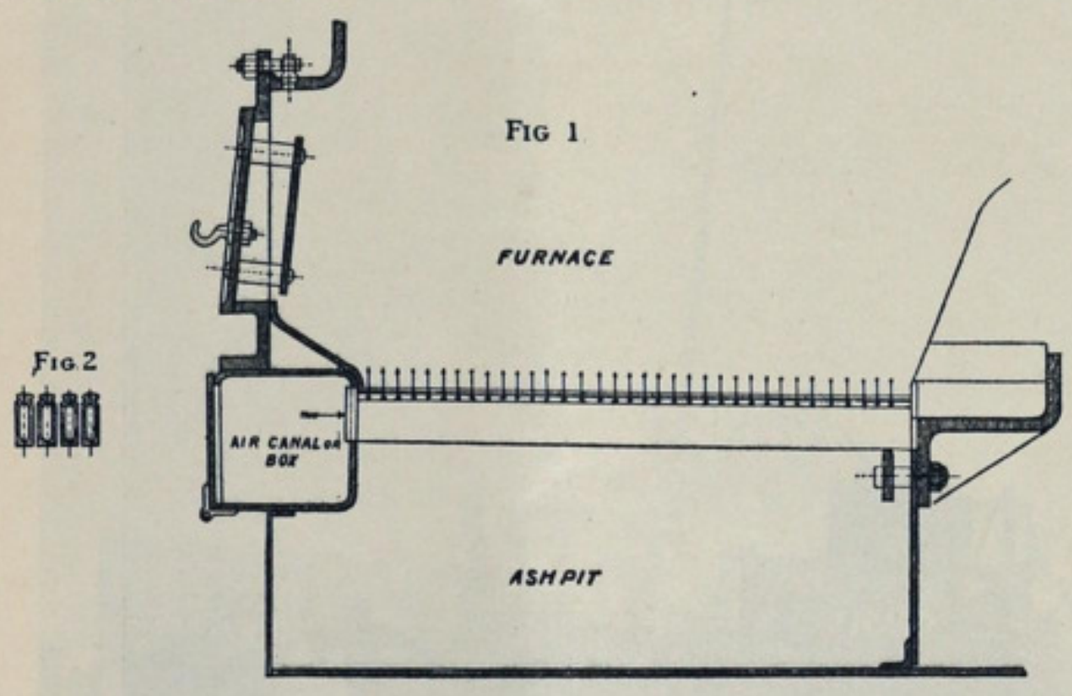


FIG 2

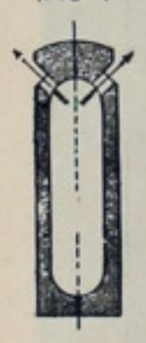
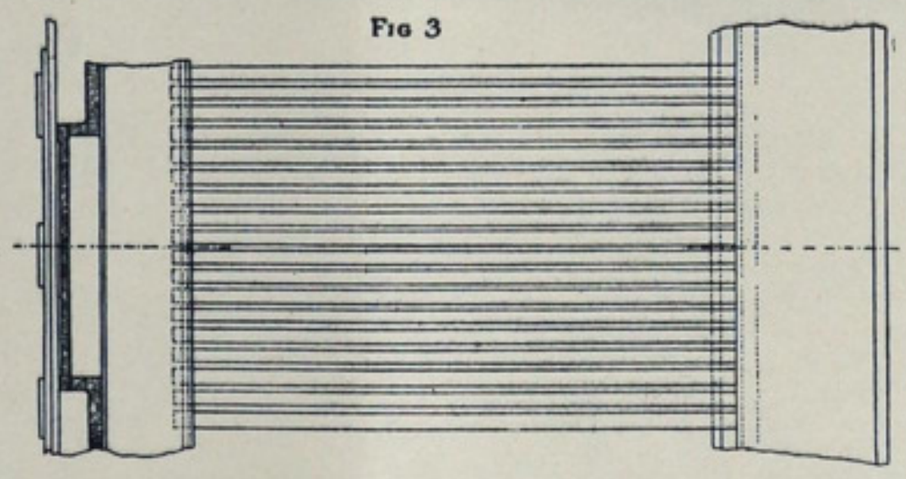


FIG 4

FIG 3



Up to the present only short bars have been experimented with, but a sample bar up to 4 feet in length has been cast without difficulty; at the same time, where it is possible to have an air box at each end of the grate, the bars need never exceed the moderate length of, say, 3 feet. A method of uniting them in the centre has always been devised for such cases as when the front only is available for an air box and a long grate is desired. It should be noted, however, that it is thought preferable, in order to give facilities for good stoking, cleaning fires, and keeping the fires in good order, to work always with short grates, and use a high rate of combustion. It has been observed during the experiments that little refuse falls into the ashpits, that the bars keep perfectly cool, and that the clinker does not adhere to them; in fact, from time to time, the clinker can be removed from the fire without drawing the same. It has also been noticed that during forced draft the bars do not suffer at all, although it is only fair to say that on one occasion the ends of some of the bars were burnt because the bridge at the back was not in order, a space being left between it and the bar ends. The bars have been tried at natural draft, and after ten days' continual steaming during day hours, no more than the normal injury was sustained, and only a few holes were found choked.

It is intended, in adopting this system, that the full advantage should be taken, making the grates moderate in length, and running with forced combustion as a normal condition. In this matter the destruction of fire bars would be reduced to a minimum, and the fires could be regulated to a nicety. The fire can be regulated also, so that it is a matter of indifference whether the fire-door is open or shut; but, of course, it cannot be overlooked that, at very high rates of combustion, especially with ordinary cylindrical boilers, the fire-door must be kept shut, as with the ordinary ashpit draft. Presuming a long life for the individual bars, the cost of production need not, it seems to the writer, be considered a serious matter; for the foundry in Naples it comes to about 10 centimes per kilogramme.

The experimental grate was 2 feet 7½ inches long and 2 feet 7½ inches wide, composed of bars of section as shown in Fig. 4; in the case of experiment No. 5, however, half the length was bricked over. The air pressure was obtained from a smithy blast, the strength of which was never more than 80 millimetres (3 1-5 inches). Coal was of the Cardiff kind of good quality. Height of funnel from bar level, 17 feet 6 inches.

RESULTS OF FORCED DRAFT EXPERIMENTS.

Experiment.	Air Pres're.	Coal lbs. per hour per sq. ft. of grate.	Jet holes.		Bars.		Observations.
			Diam.	Pitch.	Length.	Surface	
	IN.		IN.	IN.	FT. IN.	SQ. FT	
1	1.38	29	5/32	11/16	2 7½	7	Evap. trial, careful firi'g
2	1.45	32	5/32	11/16	2 7½	7	Ditto
3	1.25	41	5/32	11/16	2 7½	7	For combustion only.
4	1.73	40	5/32	11/16	2 7½	7	Evap. trial, careful firi'g
5	3.15	72	3/16	11/16	1 3½	3.22	For combustion only.
†6	3.15	53	3/16	11/16	2 7½	7	Evap. trial, careful firi'g

†During this trial it was thought that for this rate of combustion the passages to the funnel were too contracted. On measuring the same they were found to be collectively between one-sixth and one-seventh of the grate area, whereas the funnel area itself was one-fifth.

*Paper read before the Institution of Naval Architects at the recent Newcastle-on-Tyne meeting.

SALARIES OF STEAMBOAT INSPECTORS.

The salaries of the local inspectors of steam vessels at various ports for the ensuing year has just been announced by Secretary Gage of the treasury department. Under the law it is provided that the salaries of inspectors of steam vessels shall be regulated in proportion to the number of steamers inspected in each district each year, as follows: In districts inspecting 100 steamers and less, a salary of $1,200 per year each; over 100 and less than 150 steamers, $1,500; 150 and less than 200 steamers, $1,800; 200 and less than 300 steamers, $2,000; 300 and less than 500 steamers, $2,250; 500 steamers and upward, $2,500. The act further provides that the basis of salaries from the date of approval of the act March 1, 1895, shall be on the report of inspections for the preceding year, and thereafter according to the number of steamers reported inspected at the end of each fiscal year, which shall regulate the salaries for the following year, for each local board, as reported by the supervising inspector-general.

In accordance with the report of the inspector-general for the fiscal year ended June 30, 1899, the salaries of local inspectors of hulls and local inspectors of boilers from July 1, 1899, to June 30, 1900, inclusive, are established by Secretary Gage as follows:

For the districts of Evansville, Ind., Louisville, Ky., Memphis, Tenn., Nashville, Tenn., Cincinnati, Ohio, Gallipolis, Ohio, Wheeling, W. Va., Burlington, Vt., Bangor, Me., Galveston, Tex., and Apalachicola, Fla., at the rate of $1,200 per year for each local inspector.

For the districts of New Haven, Conn., Savannah, Ga., Charleston, S. C., Dubuque, Iowa, Superior (Marquette), Mich., Mobile, Ala., and Jacksonville, Fla., at the rate of $1,500 per year for each local inspector.

For the districts of Portland, Ore., St. Louis, Mo., Oswego, N. Y., New London, Conn., Portland, Me., Detroit, Mich., Pittsburg, Pa., Alaska, (Juneau), Port Huron, Mich., and Providence, R. I., at the rate of $1,800 per year for each local inspector.

For the districts of Puget Sound (Seattle), Wash., Albany, N. Y., Grand Haven, Mich., Milwaukee, Wis., Chicago, Ill., Duluth, Minn., and Norfolk, Va., at the rate of $2,000 per year for each local inspector.

For the districts of Philadelphia, Pa., Boston, Mass., Baltimore, Md., Buffalo, N. Y., New Orleans, La., Cleveland, Ohio, and San Francisco, Cal., at the rate of $2,250 per year for each local inspector.

For the district of New York, N. Y., at the rate of $2,500 per year for each local inspector.

WIRELESS TELEGRAPHY FOR MARINE SERVICE.

It is said in connection with the announcement that Marconi, the inventor of wireless telegraphy, will shortly visit this country, that he will in all probability be asked to confer with officials of the United States light-house board with reference to the use of the invention in marine work generally. Experiments with wireless telegraphy have been carried on for some time past at the United States light-house depot at Tompkinsville, Staten Island, by William F. Clarke, a New York electrician, under the direction of Col. David P. Heap, the engineer officer in charge of the third light-house district. These experiments have been made with a view to determining the availability of wireless telegraphy for purposes of, communication between light-houses, light-ships, merchant vessels and light-house stations. The interest of the light-house board in the present efforts will be readily appreciated when it is understood that the board has sought for years for some method of establishing communication between the shore and moving ships. Some years ago a telephone system was tried but it proved impracticable. In England and France very satisfactory progress has been made in experiments with the Marconi system for communication between ships and the shore.

The Nickel Plate road will run another of its popular excursions to Niagara Falls, Saturday, Aug. 12th. Train leaves Cleveland at 10.10 P. M. Bring your family and enjoy a good time at the Falls on this date. For rates and time of departure of train at intermediate points inquire of agents. No. 106. Aug. 12.

NEW YORK A LOSER

IN THE REDISTRIBUTION OF EXPORT TRADE IN CEREALS AMONG LEADING ATLANTIC PORTS.

The investigation into the vicissitudes of the foreign trade of the port of New York, which is being carried on by the state commerce commission, has brought to the surface some facts of decided interest. Perhaps the most interesting contribution that has thus far been made to the body of knowledge relating to the question is that presented in a series of tables prepared by Statistician Brown of the New York Produce Exchange, and which cover in point of time the period from 1873 to 1898. The tables give the percentages of receipts and exports of wheat, corn and flour at the beginning and the end of the period for each of the Atlantic ports, but do not touch upon the trade of the gulf ports. This presentation of the matter seems to be based upon the idea that the competition of the gulf ports is not a factor that should be dealt with extensively in the present investigation, for the reason that the gulf ports are the natural outlets for a large part of the country which is directly tributary to them, and that the conditions affecting them are properly without the scope of the commission's investigation.

The story told by the statistics given is striking enough. They tell one unvarying tale in that they show that as between the Atlantic ports New York's share of the foreign trade in grain has steadily fallen during the last quarter of a century. For example, New York's percentage of the total receipts of corn, wheat and flour fell from 61.4 per cent. in 1873 to 38.9 per cent. in 1898. Its receipts of corn fell from 54.66 per cent. in 1873 to 26.75 per cent. in 1898. The receipts of wheat fell from 80.65 per cent. in 1873 to 58.03 per cent. in 1898, and the receipts of flour declined from 47.85 per cent. in 1873 to 38.47 per cent. in 1898. When we come to consider exports of the above-mentioned products a similar story is told. The total exports of corn, wheat and flour fell from 77.9 per cent. in 1873 to 37.2 per cent. in 1898, figures showing a greater degree of decline in the export trade than in the receipts. The exports of corn fell from 66.67 per cent. in 1873 to 26.14 per cent. in 1898. The exports of wheat fell from 88.79 per cent. in 1873 to 55.49 per cent. in 1898, and the exports of flour fell from 70.41 per cent. in 1873 to 37.61 per cent. in 1898. As will be seen from a comparison of the figures given the relative decline in the export trade of the city has been proportionately greater than that in the receipts. Of the other cities with which New York is to be compared Baltimore shows the most noteworthy increase, taking the receipts and exports together. For example, that city's percentage of total receipts of wheat, corn and flour increased from 13.3 per cent. in 1873 to 23.9 per cent. in 1898; its receipts of corn from 18.71 per cent. to 29.73 per cent.; its receipts of wheat from 6.75 per cent. to 19.55 per cent., and its receipts of flour from 14.30 per cent. to 18.20 per cent. The total exports of wheat, corn and flour, on the other hand, increased from 12.7 per cent. to 25.6 per cent.; the exports of corn from 23.79 per cent. to 29.74 per cent.; the exports of wheat from 3.63 per cent. to 20.62 per cent., and the exports of flour from 15.31 per cent. to 22.33 per cent. Among the other Atlantic ports Boston shows some noteworthy gains as a port of export and Philadelphia makes a fair showing in the same direction, while Newport News, for which figures are not given reaching back to 1873, appears to secure a noteworthy and steadily growing share of the export trade. It is quite clear from the figures given that the diversion of trade from the port of New York is no figment of the imagination. It is evident that conditions and forces have been at work which have made steadily for a redistribution of the export trade in cereals among the leading Atlantic ports, and that in that redistribution New York has been distinctly a loser.—Bradstreets.

A GOVERNMENT SHIP PURCHASED FROM SCOTLAND.

There appears to be some difference of opinion between officials of the treasury and navy departments as to whether American registry can be secured for the collier Scipio, soon to be sold by the navy department. A despatch from Washington states that the commissioner of navigation of the treasury department has informed the navy department that the prospective purchasers of the collier Scipio will be unable under the law to secure American register for the vessel. The legal officers of the navy department take issue with this opinion, and the question is still unsettled. The navy department has already advertised the Scipio for sale, as the navy has no further use for the vessel. Just before the Spanish war the government purchased the ship for use as a collier in connection with the North Atlantic fleet. The vessel was under Scotch register until she became the property of the navy department. Commissioner Chamberlain of the treasury bureau of navigation does not recognize the claim of the navy department that the acquisition of the vessel by the navy wipes out the consideration of her foreign register when it is proposed by private owners to register her in this country. The navy department wishes to assure prospective buyers that American register can be secured, in order that a higher price may be obtained for the vessel than would be the case if her trade should be restricted.

The United States civil service commission announces examinations to be held Sept. 5 and 6 for the position of assistant draughtsman in the ordnance service, and on Oct. 17 and 18 for the positions of inspector of hulls and inspector of boilers, steamboat inspection service. From the eligibles in the first instance certification will be made to fill the position of assistant draughtsman at the Washington navy yard at a salary of $772 per year, and in the second to fill the positions of inspector of hulls and inspector of boilers at Charleston, S. C., at a salary of $1,500 per annum. Persons desirous of taking the examination may procure blanks from the civil service commission at Washington.

The Russian ice breaking steamer Ermack reached Spitzbergen on June 6 with a scientific expedition on board, cutting through 6 to 7 feet of ice at a speed of 2 miles an hour and reaching 79 degrees 10 minutes North latitude, a higher altitude, it is claimed, than has ever before been reached at that time of year.

STRENGTHENING THE YACHT SHAMROCK.

No such care has been exercised with other challengers for the America's cup as is now being taken with the Shamrock to strengthen her so as to meet the risks and contingencies of the voyage across the Atlantic. The firm of Scott & Co. of Greenock on the Clyde performed this work, and naval architects who have seen the result of their endeavors declare that they have well fulfilled their task. Notwithstanding the fact that the shell of the Shamrock, together with her under body, top sides and deck consist of metal plating which is for the most part only three-sixteenths of an inch in thickness, there are stays and ties so distributed behind this shell as to efficiently brace her against any great strains. Special measures have also been taken to prevent damage from heavy weather on the voyage across. It is notable, also, that every detail of these plans for the strengthening of the vessel was mapped out before the construction of the yacht was begun.

The system of strengthening the vessel is in the main very simple. It consists primarily of screw braces and trusses of special design. The interior of the hull is strapped from end to end with heavy stay battens, and screw trusses have been led from side to side and screwed out until they bear hard against the stays Similarly, screw braces were led from the bilges to the deck, and thus all screwed up the hull is secured against all chance of working or giving in any direction. To protect the light metal deck from bulging or straining under the impact of Atlantic rollers, a heavy sheathing of wood plank has been fitted and bolted to the supports below.

The Shamrock makes the voyage across, as did the Valkyries, under ketch rig, having two masts so placed as to constitute the style of rig mentioned—a compromise between a schooner and a yawl. The main mast is carried forward in the step belonging to the racing mast and a big mizzen mast is stepped well aft over the rim of the counter. These masts, with the other spars, such as booms and gaffs, are of wood of very large proportions for an ocean rig.

REDUCTION IN DRY DOCK CHARGES.

Dry dock owners on the Pacific coast, and more especially in British Columbia, are highly incensed by reason of the action of the Dominion government in reducing the scale of charges for service at the Esquimalt dry dock. The claim is made that the new schedule of charges is manifestly unfair to private concerns, and in support of this contention attention is directed to charges now prevailing at other Pacific coast ports, at Hong Kong and at certain points on the Atlantic. What contributes especially to the dissatisfaction is the fact that the old rate charged at Esquimalt was less than half the rate charged at San Francisco or Tacoma. Taking for purposes of comparison the charges for a first day and also one lay day the existing rates make the following showing: San Francisco—2,000 ton vessel, gross tonnage, first day 40c. a ton, $800; lay day 20c. a ton, $400—$1,200. Tacoma—first day 30c. a ton, $600; lay day $400—$1,000. Hong Kong—Empresses, $850 first two days, after that $250. Esquimalt—Empresses, $520 first two days, after that $120. Quebec (government dock)—first day $350; lay, 4½c. a ton, $90—$440. Halifax—first day, 20c. a ton, $400; lay, 12½c. a ton, $250—$650. Kingston—first day, $250; lay, 7c. a ton, $140—$390. Esquimalt—Old rate, first day, $350; lay, 4½c. a ton, $90—$440. Esquimalt—Cut rate, first day, $200; lay, $50—$250.

CLASSED IN THE GREAT LAKES REGISTER.

Sixty-two vessels were classed in the Great Lakes Register, Cleveland, during the month of July and of this number six are vessels built under supervision of the register. The list follows:

Vessels built under supervision—Steamers Arthur Orr, Aurania, Henry W. Oliver, Illinois and Jesse Spalding.

Steamers classed—Badger State, Bannock Burn, City of Chicago, City of Genoa, City of Louisville, City of Milwaukee, City of Naples, Eber Ward, Empire State, Eureka, Garden City, Ionia, Iosco, Jas. Fiske, Jr., John F. Eddy, John M. Nicol, Joliet, Marquette, Mary A. McGregor, Mary H. Boyce, Meriden, Milwaukee, Montana, Oregon, Northern King, Northern Light, Northern Queen, Northern Wave, Northland, North Star, Northwest, North Wind, Portage, Rosemount, Senator, St. Paul, Swallow, Thomas Davidson, Tom Adams, Torrent, Vanderbilt, Vega, Vulcan, Wm. H. Stevens.

Sailing vessels classed—Dunmore, Fanny Neil, Grace Gribbie, Mt. Downing, Manitou, Melrose, Minnedosa, Mystic Star, Robert L. Fryer, S. A. Wood, S. M. Stephenson, Sophia J. Luff, Selkirk.

NEW STONE AND CONCRETE DOCK FOR BROOKLYN YARD.

Naval Constructor F. T. Bowles, who is in charge of the Brooklyn navy yard, has just forwarded to the navy department his annual report, in which he recommends the construction of a new stone and concrete dry dock. Constructor Bowles' report will be incorporated in the report of Chief Naval Constructor Hichborn and it is the impression in naval circles that the recommendation regarding the proposed new dock will be approved by the chief constructor. Mr. Bowles also advocates the removal of a portion of the Cob dock, in order that piers may be run into the Wallabout bay channel. The report shows that more than one hundred naval vessels were sent to the Brooklyn yard for repairs incidental to service in the Spanish-American war and more than $1,000,000 was expended on repairs. Of this sum over $100,000 was expended in putting the Buffalo in shape for her trip to the Philippines; $16,000 in repairs to the Oregon, and $25,000 on the Iowa preparatory to her voyage around the continent.

At no time in the history of the Cramp yard, Philadelphia, have ship building operations been more active than at present. Six vessels are now on the stocks and the keels of six others will be laid as soon as room can be found for them. The next launch at the yard will be that of the Russian cruiser Variag in September and this will be speedily followed by the new Plant liner. The keels of the steamers Sierra and Sonoma, to be built for the Oceanic company, are now being laid; the Russian battleship Retvitzan is almost half completed, and the frames of the battleship Maine are being placed in position. It is hoped that the battleship Alabama will be enabled to make her trial trip in September.

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A list of tools for the new machine shop at the Brooklyn navy yard, for which bids will soon be opened by the navy department, includes one 96-inch, one 60-inch, one 48-inch, one 42-inch, three 36-inch, one 30-inch and one 16-inch, one horizontal boring, drilling and milling machine; one portable milling, boring and drilling machine; one horizontal boring and milling machine; one horizontal boring and drilling machine; two universal horizontal drilling and boring machines; one 30-inch boring and turning mill; two 42-inch boring and turning mills; one extra heavy 10 feet by 16 feet boring mill; one 9-foot universal radial drilling machine; two 72-inch universal radial drills; two 72-inch semi-universal radial drills; five 72-inch radial drills; three 37-inch back-geared power feed drill presses; eight 30-inch back-geared power-feed vertical drill presses; eight 21-inch vertical drills; six 16-inch sensitive drills; six 13-inch sensitive drills, and two universal milling machines.

Wage advances made at the Gogebic range mines of the Lake Superior region in the past ten days, started with those of the Oliver Mining Co., are calculated to hold mining forces intact, though some diversion of labor to harvest fields has been noted. Reports continue to come in of new finds on the old ranges, activity being greatest, perhaps, on the old Menominee range of Michigan. Much is being done in the way of reopening old properties of small extent, and in addition new operations are being started in districts known to be iron bearing, but let alone, waiting for such a time as the present, when demand outruns immediate supply.

The German ship building industry is making strides corresponding with the general commercial progress of the empire. In 1898 there were in course of construction for foreign navies twenty-two battleships, viz., one armed cruiser, three big protected cruisers, ten torpedo-boat destroyers, and eight torpedo boats. Of these one torpedo-boat destroyer falls to Brazil, one to Japan, together with eight torpedo boats and one armed cruiser, the latter at the price of 13,000,000 marks. Italy takes four torpedo boat destroyers and Russia four torpedo-boat destroyers and three big cruisers, the latter at a value of 24,000,000 marks.

Admiral Betolo of the Italian navy has completed designs for four Italian battleships, which will be constructed at once and in which it is claimed by Italian technical journals the admiral has solved the problem of uniting in one vessel of great size all the advantages offered by battleships and cruisers, namely, high speed (22 knots at least) and the most powerful armor and armament. Steam will be generated in what it is claimed is an entirely new and novel form of water tube boiler. The displacement of the vessels will not exceed 8,000 tons each.

The Oliver Iron Mining Co. announced on July 31 to all its employes on the Gogebic range that beginning Aug. 1 an advance in wages would be made, bringing the schedule to $2.25 for contract miners, $2 for company account; $1.90 for contract trammers, $1.75 company account; $1.70 for timbermen, $1.50 for surface and laborers, and other grades of mine workers in proportion. This advance was followed by a similar announcement at other properties, so that the 10 per cent. advance is now in effect at practically all the mines on the Gogebic range.

SOME SHIP MATERIAL TO BE HAD.

It is not true that the steel manufacturers who have been supplying the ship yards of the great lakes are unable to undertake any further orders for material for new vessels. Circumstances connected with certain negotiations that have been under way in Cleveland during the past few days bring out the fact that one concern is prepared to furnish 10,000 tons of material, to be delivered during the balance of this season and early in 1899. This is certainly quite an item of tonnage in times like the present, as some firms are unwilling to make quotations of any kind on business for next year. The price asked for the material referred to is, of course, high—certainly not 2½ cents a pound—but even at this figure it will very probably be taken up, as better than 3 cents has been paid on small lots of ship material on which immediate delivery was required. With this material on the market, and in view of the fancy figures that are certain to prevail in the lake freight market all through the fall, it would not be at all surprising to hear of contracts shortly for a few more ships to be delivered early in 1900.

BREAKING ALL RECORDS IN PIG IRON.

The usual monthly pig iron reports show that the largest pig iron tonnage in the history of the United States was produced during the month of July. In gross tons the estimated weekly output was 269,032 tons on Aug. 1, as against 256,878 tons for the month previous, or an increase of 12,154 tons weekly. The limit of production has not been reached, however, as a number of furnaces went out of blast last month and new ones building are soon to be fired. Comparing the present output with the output for the month ending Aug. 1, 1898, when the weekly capacity of the furnaces was 210,258 tons, we have an increase of 58,744 tons weekly; compared with August, 1897, when 167,268 tons was the weekly production, the increase is 101,764 tons.

DEMANDS OF A GREAT COUNTRY.

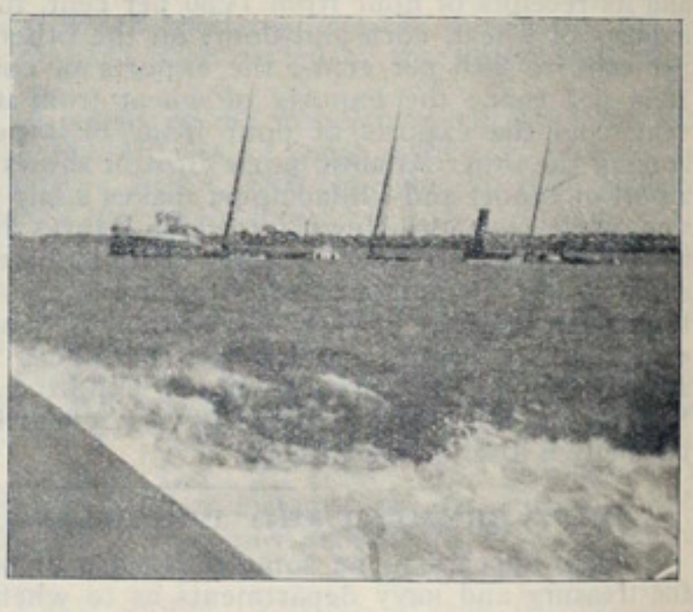
EXEMPLIFIED IN THE HIGH FREIGHT RATES ATTAINED IN A FEW MONTHS ON THE GREAT LAKES—RETURN OF CARRYING CHARGES THAT WERE THOUGHT TO BE A THING OF THE PAST.

Two dollars on iron ore and one dollar on coal are not at all among the improbabilities in lake freights during the coming fall; not on large quantities of either commodity, of course, but to cover obligations on the part of the shippers that must be fulfilled. This opinion is based upon the strides that have already been made in grain freights out of Duluth, which have reached 3¼ cents for immediate loading and 4 cents for the last half of October. If the wheat crop now being harvested in the northwest is not a disappointment, there is no telling how high lake freights may go. The situation is such that as high as $1.30 has already been paid by some of the ore shippers to vessels that are to make two to four trips from the head of Lake Superior. Following these transactions, such of the vessels as are free of contracts are being held for trip-to-trip charters in anticipation of a steady rise in the market for the balance of the season.

What a strange condition of affairs and how great are the resources and demands of a country that bring about such changes! Little more than six months ago the great bulk of the lake fleet that moves about 15,000,000 gross tons of ore, 8,000,000 tons of coal and some 250,000,000 bushels of grain and flour, to say nothing of lumber, copper, package freight, etc., was placed under contract on a basis of 60 cents a ton for moving ore 900 miles or more from the head of Lake Superior to Lake Erie ports. At that time a lake freight of more than $1 was looked upon as a thing of the past, more so probably than the $20 a ton price on pig iron that has multiplied ten times over the profits of furnace owners. But as with the ore dealers who sold to the furnacemen at low figures, so also with the vessel men—only a few of them who are not tied up to low freight contracts are profiting by the high freights here spoken of. Most of the others will share in it later on, as the ore contracts are not all made to include the very last of trips in the fall, and there is therefore general satisfaction among the vessel interests. They will all derive some advantage from the high freights.

Notwithstanding the steady advance in lake freights from the first days of navigation, together with a late opening, the shipments of ore to Aug. 1 are full 800,000 tons ahead of last year. Complete reports from the managers of shipping docks at upper-lake ports show a total to Aug. 1 of 7,639,706 gross tons, against 6,818,887 tons on the same date a year ago. The ore movement during July of this year aggregated 2,896,715 gross tons, as compared with 2,206,714 tons during July, 1898.

COLLISION IN DETROIT RIVER.



The accompanying illustration from a snap shot photo gives an idea of the appearance of the steamer W. B. Morley after her collision with the car ferry Lansdown in the Detroit river near the city of Detroit. The Morley went to the bottom when 300 feet from the dock at Detroit. The car ferry succeeded in reaching her slip at Windsor. There are conflicting reports as to the cause of the collision, but according to a majority of the statements it was due to a misrepresentation of signals. There is every probability that legal complications will be avoided, as it is expected to settle the matter out of court. The contract for raising the Morley has been awarded by the underwriters to Horace Bocker on a bid of $6,000. Wreckers are at work on the Lansdowne and the vessel will be raised within a day or two. For the photograph reproduced herewith the Review is indebted to Mr. H. W. Boers of the L. Black Co. of Detroit.

"I was at Amherstburg, Ont., a few days ago," says a Cleveland vessel owner, "and I am quite sure from what was said there that the Canadian light-house officials will soon refuse to maintain the line of black stakes on the west side of the channel leading up the river from Bar point light, unless vessel masters are more careful in navigating the channel. The stakes have been carried away repeatedly and there is quite an expense attached to providing new ones. In one night recently five of them were carried off by passing vessels. There is no reason why vessels should work so far over to the westward of this channel, and it would seem that the captains should have some consideration for important marks of this kind maintained for their guidance. There are few deep-draught Canadian vessels making use of this channel, and it would not be at all surprising, if the trouble continues, to hear of an order from the Canadian government for the removal of the stakes altogether."

The Cramp Co. of Philadelphia has secured a contract to make repairs on the entire fleet of Ward liners, including the steamers Seneca, Seguranca, Yucatan, Orizaba and Niagara. It is said that this is the largest repair contract ever awarded to an American ship building concern.

Owners of a six-masted schooner building at Camden, Me., have finally, after much controversy, decided to name the spars of the vessel fore, main, mizzen, jigger, spanker and driver.

Melancthon Simpson, well-known ship builder of St. Catherines and Toronto, died in the latter city recently of pneumonia. He was aged seventy-four years.

NEW PLANT LINER.

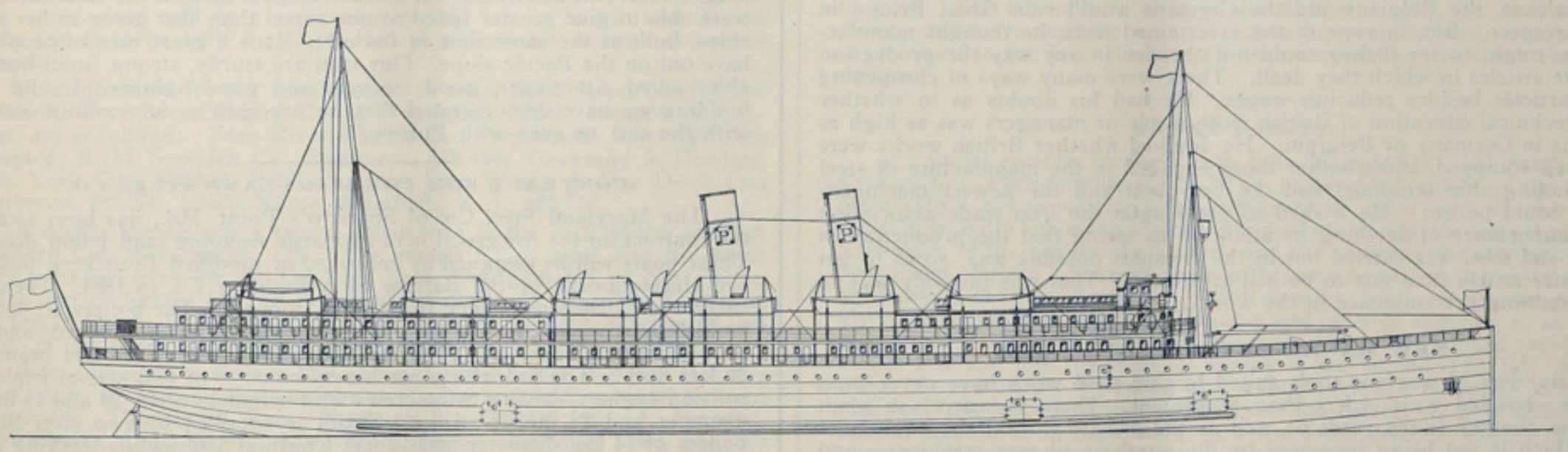
THE HANDSOME TWIN-SCREW, 400-FOOT STEEL STEAMER BUILDING AT THE WORKS OF THE WM. CRAMP & SONS SHIP & ENGINE BUILDING CO., PHILADELPHIA.

The Review presents herewith an outboard plan of the new passenger steamer building for the Plant system by the Wm. Cramp & Sons Co. of Philadelphia. Characteristic features of this vessel are such as to place her in the front rank of her class. She is intended for coastwise traffic and is designed to have on a draught of only 18 feet, a cargo capacity of 3,800 tons, and to attain with cargo a speed of 18 knots. This speed is no mere estimated or hoped for attainment, but is guaranteed on a long-distance loaded trial of a very complete character, much more thorough indeed than government tests, inasmuch as it comprises a requirement of performance on a fixed total quantity of coal. These results are looked forward to with confidence by builders and designers, the latter being Mr. Reginald P. Bolton, M. E., of New York, who has been aided by Mr. E. J. Moynihan, his associate.

Dimensions of this new steamer are: Length between perpendiculars, 400 feet; beam 50 feet; moulded depth, 36½ feet; making her one of the largest of her class. The hull will be provided with double bottom, and will be divided into nine compartments by eight water tight bulkheads carried without any openings up to the under side of the main deck. One of these bulkheads divides the boiler room and coal bunkers into two parts, thus reducing the risk of crippling the steam power. Bilge keels of unusual proportions, and a fender for docking, are provided. This vessel will, of course, be classed as an auxiliary cruiser and will enter a trial for classification under the provisions of the postal subsidy act.

Accommodations of a liberal character are provided for 350 first-class and for 100 second-class passengers. These include 100 staterooms 8 feet deep, opening out on the upper decks. All the first-class accommodations are above the main deck. A handsome saloon to seat 140 persons is on the upper deck, with a ladies' saloon and a smoking room forward, with the purser's office conveniently accessible; also toilets readily reached, and all under cover. The saloons are lighted and ventilated by a central trunk skylight, 7 feet wide. In the saloon a novel feature will be separate tables for parties of four, and in the music room a grand piano will be placed, enabling a singer to face the audience. The upper deck affords a sheltered promenade the full length of the ship of not less than 8 feet width on each quarter, and the awning deck above is 340 feet in length and of not less than 10 feet width, with an extension forward around the foremast, affording to passengers a clear view ahead. On this deck the boats are usually placed, but in this new vessel they will be overhead, and some improvements in arrangements for launching will add to the security of passengers. The engine and boiler room casings are carried up above this deck to the bridge head, as well as the galley vent, thus freeing passengers from the smells incident to the location of such vents on deck. There are two bridges, one forward and one aft, with two systems of steering, whereby this large vessel can be maneuvered in and out of troublesome channels. Much attention has been directed to the sanitary appliances, which are probably more elaborate than anything heretofore afforded. Each range of staterooms has respective toilets, situated at the stairways, and thus readily accessible, and at the same time situated vertically over each other on their respective decks. Bath rooms are provided and can be connected with certain of the staterooms for the use of invalids, for whom specially large and airy rooms have been provided. Separate systems of conveniences exist for each class of labor required in the operation of the ship, such as firemen, waiters, oilers and cooks; also for second-class passengers and crew. The cooking and pantry arrangements are very complete, and are designed to reduce the labor involved. The galley and pantries are below the saloon, the materials being delivered by four dumb-waiters. The galley is ventilated up the boiler room casing, and is fitted with appliances for refrigerating, cooking and cleaning. The store rooms and mess rooms are all arranged in close proximity.

Arrangements for rapid handling of cargo comprise five elevators reached by side ports, and a quick-acting winch at forward hatch. Coaling will be effected by a newly designed apparatus capable of coaling the ship within two hours, a task worthy of note, as she carries five days' supply for full speed of 18 knots, or nine days' supply at reduced speed. Ashes and garbage are dumped directly overboard. A large mail room is provided, with mail doors, starboard and port, and with apparatus to deliver and receive mail bags to and from small boats. The vessel will be propelled by twin-screws operated by triple expansion four-cylinder engines. She is to be fitted with two pole masts, carrying leg-of-mutton sails and staysails, and will have two funnels.



THE NEW PLANT LINER BUILDING AT THE YARD OF THE WM. CRAMP & SONS CO., PHILADELPHIA.

The Gas Engine & Power Co. of Morris Heights, New York, has launched the 80-foot naphtha launch building for George M. Allen.

OUR NAVAL PROGRAM.

AN ENGLISH AUTHORITY COMMENTS ON THE TENDENCIES MANIFEST IN OUR POLICY CONCERNING THE CONSTRUCTION OF WAR VESSELS.

The naval policy of the United States, more particularly as it concerns the war vessels planned or in course of construction, continues to be a matter of special interest to foreign powers. Commenting upon American naval ship building, the United Service Gazette of London, says:

"The authors of the new programme show that they appreciate the importance of seagoing vessels, and, indeed, when it is remembered that the greatest exponent of the orthodox school is an American, they could not fail to remember its teaching. The two naval wars that have been fought since 'The Influence of Sea Power' appeared have been startling confirmations of its theory. Although the monitor first appeared on the American coast, and the great extent of seaboard covered with ports and towns must always be a weak point, they have not hesitated to put the means of offence in the first place. It must be remembered, however, that the attack of the American coast from a base across the Atlantic is a very different operation from such an attack by one European power on another where the seas are narrow. But vessels carrying on war directly against the resources of an enemy by attacking a coast can be brought to action more easily than those pursuing the same aim by attacking commerce afloat. The first object is fixed, while the latter is in motion, although generally within certain limits. Nor have the Americans reproduced the type of 'commerce destroyer' they were the first to turn their attention to. No Columbia or Minneapolis adorns the new programme. The large cruisers that do appear there are more adapted for cruiser-catching. But they are at the same time building quite a flotilla of destroyers and torpedo craft. It would appear, however, that they do not attach much importance to submarine navigation, as the Plunger, which was launched in August, 1897, remains in much the same condition. They have been experimenting with such craft since the beginning of the century, when they very nearly blew up the Eagle, a British 64, in New York harbor. Another such vessel was planned during the civil war, and attacked the Housatonic in Charlestown harbor. Both vessels were destroyed, and it seems that the submarine attacked without diving, being submerged to the hatch coaming, but leaving the cover open for air. There were few complicated arrangements inside then. The explosion threw up a wave which swamped the vessel and drowned the crew, who thus shared the fate of three other crews who had had her in charge. Each crew consisted of nine men—a pilot and eight others who moved cranks on the screw shaft—but only two out of the thirty-six men who made up the four crews seem to have survived."

SUMMING UP ADVANTAGES OF THE CONSOLIDATIONS.

Charles R. Flint of New York, who has been a leading factor in the formation of several of the large industrial organizations, thus sums up the benefits of consolidation:

"In this country, in addition to getting the advantages of putting private business into corporate form, we are obtaining the benefits of consolidated management. We thus secure the advantages of larger aggregations of capital and ability. If I am asked what these are, the answer is only difficult because the list is so long. The following are the principal ones: Raw material bought in large quantities is secured at a lower price; the best quality of goods is produced; the specialization of manufacture on a large scale in separate plants permits the fullest utilization of special machinery and processes, thus decreasing cost; the standard of quality is raised and fixed, and the best standards adopted; those plants which are best equipped and most advantageously situated are run continuously and in preference to those less favored; in case of local strikes or fires the work goes on elsewhere in such a way as to prevent serious loss; there is no multiplication of the means of distribution; terms and conditions of sale become more uniform, and credits, through comparisons, are more safely granted; the aggregate of stocks carried is greatly reduced, thus saving interest, insurance, storage and shop wear; greater skill in management accrues to the benefit of the whole instead of a part, and large advantages are realized from comparative accounting and comparative administration. The grand result is a much lower market price, which accrues to the benefit of the consumers, both at home and abroad, and brings within reach at the cheaper price classes and qualities of goods which would otherwise be unobtainable by them. This is the great ultimate advantage, and if this were not sooner or later true, if the world at large did not ultimately reap the benefit, the other advantages would be as nothing."

A movement is on foot in Hamburg for the establishment of a practical school of naval architecture. At present there is no institution of this character in Germany.

AMERICAN STEEL FOR BRITISH VESSELS.

G. W. Wolff, M. P., of the firm of Harland & Wolff, Belfast, Ireland, builders of the Oceanic, is the latest British ship builder to sound a warning note anent American competition. At a recent dinner of the British Iron Trade Association Mr. Wolff said he had been connected with the members of the association for many years, and while they had done a great deal to benefit the iron trade he might claim, as a considerable user of iron and steel, to have in that indirect manner shared in the results. The iron and steel trade occupied a position which few other industries did. With their coal and iron the British were the first country to lead the way in large manufacturing industries; they were at the head of all other nations, some of which were, however, beginning to run them very close. There was a time when Great Britain had almost a monopoly of the trade of the colonies. They still had the lead, and it had lately been increasing, but the Germans and Belgians, and above all the Americans, were increasing their trade by larger percentages than Great Britain. That was a very serious matter.

But there was another aspect of the question; how far were the British able to keep their position against the competition of foreign nations? He had been engaged in the shipping and ship building trades for upward of forty years, and if anybody had told him up to the last two or three years that the time would come when British yards would build ships of steel manufactured in America he certainly would not have believed it. Nevertheless such had been the case. Large quantities of steel had lately been purchased from America. He could only say that the steel had been as good as any made in Great Britain, and that it had been no dearer. He was perfectly aware that special circumstances had enabled the Americans to sell their steel in competition with British firms.

The British iron master was so busy that he could scarcely execute any orders, and people like himself were obliged to get it where they could. However, the fact remained that the Americans were able to deliver steel of good quality at the same price, and even lower, than the British iron master could supply it. He did not take the view that the Americans, the Belgians and the Germans would ruin Great Britain in this respect. But, in view of the ascertained facts, he thought manufacturers ought to see if they could not cheapen in any way the production of the articles in which they dealt. There were many ways of cheapening the articles besides reducing wages. He had his doubts as to whether the technical education of British workpeople or managers was as high as it was in Germany or Belgium. He doubted whether British works were as well equipped, and whether those engaged in the manufacture of steel (including ship building) had the very best and the newest machinery that could be got. He wished to press upon the iron trade association the importance of devoting its attention to seeing that the production of iron and steel was carried out in the cheapest possible way, so as to get a better article than was to be had at present. That was the only way of maintaining pre-eminence in the world.

NEW MACHINERY FOR SHIP YARDS.

Builders of machine tools suited to ship yard work have never been more crowded with orders than at present. There is scarcely a plant in the country (navy yards as well as the private works) the equipment of which is not being increased by the purchase of new machinery, and with the new plants that have recently come into existence a demand has been created which is, to say the least, very brisk. The New York Ship Building Co. is making large purchases of tools for its new plant at Camden, N. J. Bids have been invited for supplying two 60-inch lathes, 50 feet and 60 feet between centers and also for shears, punches and boring mills. The Detrick & Harvey Machine Co. of Baltimore, who, by the way, are operating their plant twenty-four hours a day, have an order from the New York company for an open side planer of very large dimensions. For such tools and appliances as may be used in the construction of the plant the ship building company is specifying short deliveries. The Philadelphia Engineering Co. is another concern that is running day and night, and among the contracts upon which they are at work is one for a 3,000 pound electric crane for the League island navy yard. The Newport News Ship Building & Dry Dock Co. recently placed an order for a deck planing machine with Thomas H. Dallett & Co. of Philadelphia.

ACCIDENT ON THE ARGONAUT.

A serious accident occurred this week on the Lake submarine torpedo boat Argonaut at the Boston dry dock in Brooklyn. The introduction of a lighted lamp into the gasoline tank of the vessel resulted in an explosion in which three persons were injured. The damage to the boat was slight. Work has been progressing rapidly on the Argonaut, which is being lengthened and changed in many respects. Simon Lake, the inventor, is of the opinion that she will be able to make a trip to the bottom of New York bay inside of two weeks. The Argonaut, when completed, will be sufficiently strong to withstand the pressure of water at greater depths than in her former condition and Mr. Lake thinks that she will consequently be of far greater value for recovering sunken property and making scientific investigations.

Mr. Frank E. Kirby of the Detroit Ship Building Co. is highly elated over a recent trial of the steamer Toronto, built for the Richelieu & Ontario Navigation Co. by the Bertram Engine Works Co. of Toronto. Mr. Kirby acted as consulting engineer during the construction of the vessel. According to the terms of contract the Toronto was to make on a regular service trial a speed of 17 miles an hour on a consumption of two pounds of coal per horse power per hour. When the trial was made a few days ago the vessel maintained an average speed of 17.3 miles an hour on a consumption of 1.72 pounds of coal per horse power per hour. It is claimed that this is the lowest rate of fuel consumption on record. The Toronto is fitted with the Howden system of hot draft.

The Nickel Plate road in connection with its excursion to Niagara Falls on Aug. 3 will sell tickets from Niagara Falls to Montreal for $9.50 extra. Liberal return limit. A peerless trio of fast express trains daily. Ask agents.
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IRVING M. SCOTT ON PACIFIC COAST SHIP BUILDING.

Mr. Irving M. Scott, vice president and general manager of the Union Iron Works, San Francisco, has considerable to say relative to ship building methods on the Pacific coast, and the advantages possessed by yards in that locality, in an article relative to Dewey's flag ship, the Olympia, which appears in the current issue of the Saturday Evening Post. Taking the performances of the Olympia as a text, Mr. Scott says of that vessel:

"She never made us any trouble and she has been no trouble to the government since. We took the contract just as we would that of an ordinary war ship and carried it out successfully both from our own and the government's standpoint. We can do things out west in the ship building way that cannot be done in the east, in spite of the fact that we pay higher wages on the average than the eastern builders do. In the first place, our men can work the entire working days of the year. They are never forced to stop work on account of the weather. It is never too hot to do a full day's work and never too cold. Then, again, we do not have to build shelters over our ships to keep out the snow and rain, and in winter we do not have to heat our ships. We save in many ways in spite of our increased pay-roll. In addition to this we are so far from the manufacturing center that we are obliged to make the entire ship in our own shops—electric light, the engines, steering gear and windlasses—the whole outfit is made by us except the plates. Those we buy in the east. This home work gives a uniformity of design and quality. We can insure honest work all through. There are shops in the east and in England which supply the various parts of war ships, and of course their work is of varying quality, but we can guarantee our goods. When we built the Olympia we knew what we were putting into her down to the smallest bolt. We relied only on ourselves and we are satisfied with the result.

"The Oregon, which was the last of our war ships, shows that we are able to construct a battleship that is not top heavy and can carry a greater armament with less displacement than has ever been attempted in any other country in the world. With the Oregon, as with the Charleston, we were able to give greater speed to our vessel than that given to her sister ships, built at the same time in the east. It is a great race of people we have out on the Pacific slope. Our men are sturdy, strong, stout-hearted, able-bodied Americans, good workers and good fighters. In our ship building we have demonstrated that we are able to successfully compete with the east or even with Europe."

CONTRACT FOR THE MARYLAND STEEL CO.

The Maryland Steel Co. of Sparrow's Point, Md., has been awarded the contract for the construction of two large seagoing sand pump dredges. These boats will be designed as improved or modified Branckers, built for the Mercey board by the Barrow Ship Building Co. in 1894. They will carry over 3,000 tons of sand in fourteen hoppers. The boilers are located amidship between the hoppers, the pumping room is forward, and the propelling machinery aft. They are each 320 feet long, 48 feet beam and 21 feet deep. The propelling machinery consists of two sets of triple expansion engines, driving twin screws with cylinders of 18, 28 and 44 inches diameter and 28 inches stroke. Steam is supplied by two steel Scotch boilers of 14 feet diameter and 12 feet length at 180 pounds working pressure. Forced draft will be fitted. The sand pumping machinery consists of a 48-inch suction tube connected to a large centrifugal pump, which is worked by two 800 horse power compound tandem horizontal engines. A large compound duplex circulating pump is used for flushing the hoppers. Each hopper has a rectangular discharging gate, which is operated by a hydraulic valve. There are two winches, a powerful windlass, a complete electric plant, which includes searchlights, an evaporator, steam steerer and other modern auxiliaries. These vessels must be completed by May 1, 1900, and the contract price for the two is in the neighborhood of $750,000.

RECORDS OF IRON MINING.

The present season is likely to see the establishment of many new records in iron mining on the Mesabi range of Minnesota. New evidences of this fact are being presented daily. One of the most striking of these is found in the showing of the Oliver Iron Co.'s Mountain Iron mine, which started out early in the season by shipping from 5,000 to 7,000 tons of iron ore a day and which has more recently run shipments up to 8,000 to 11,000 tons a day. The Fayal mine will, in all probability, reach an output of 1,000,000 tons this season. The railroads of Minnesota also appear to be holding up their end of the work in pretty good shape. The Duluth & Iron Range road is fully 350,000 tons ahead of last year, and the Duluth, Mesabi & Northern will make a showing nearly as favorable. Satisfactory progress is being made on the extension of the Eastern Minnesota railroad from Hibbing to the Sauntry mine, but there is little likelihood that any ore can be hauled over the line before Sept. 1.

The famous Knapp roller boat which it was recently proposed to utilize in ferry service at Prescott, Ont., came near having an inglorious end. Various accounts of just what happened after the boat left Toronto have been given, and although they differ in detail, they are unanimous in the verdict that the roller boat would not roll and became unmanageable in a moderate wind. Five days after leaving Toronto the boat was reported as tied to a tree at Bowmanville, Ont., having rolled 41 miles in the five days. It has been announced within the past few days, however, that the determination to roll the boat to Prescott will be persisted in and that she will there be remodeled.

A revulsion of feeling against high speed torpedo craft is very manifest among British ship builders as a result of the difficulty experienced in some quarters in getting vessels accepted. As evidence of the existing state of affairs it may be mentioned that within a single week, recently, three destroyers completed years ago had their trial trips. The Fervent was built five years ago, the Otter over two years ago and the Express more than a year since. There are other unaccepted vessels fully as old as the Fervent, and some of them have had innumerable trials but in each case have failed to come up to the speed prescribed.

IN THE SHIP YARDS OF AMERICA.

The Moran Bros. Co. of Seattle, Wash., are making excellent progress with the enlargement and improvement of their plant. The principal new building is almost ready for the roof. The flooring has been laid and a large part of the new machinery placed upon it. Workmen are now employed upon the foundation of a steam hammer, and a large punch, which is to be added to the machinery equipment, has already arrived. Mr. Robert Moran says that the plant when completed will be one of the finest and most complete on the Pacific coast. Work on the tug building for Capt J. B. Libby has been delayed, owing to inability to secure material, but a supply has now arrived and the work will proceed. The Moran company has within the past few weeks laid the keel for a steel tug, which they will employ in their own service.

George E. Currier & Co. of Newburyport, Mass., are at work on a steam lighter for the Cape Ann Granite Co. Charles R. Sargent of Newburyport, has the contract for the machinery. The lighter will be practically a duplicate of the W. H. Moody, built last year, and will be 100 feet in length, 30 feet beam and 7 feet draught. She will be fitted with a 200-horse-power engine with a cylinder of 24 inches diameter and 2 feet stroke, to which steam will be supplied by an Almy water tube boiler. The lighter will have a full complement of steam pumps, wrecking pumps, capstans and steering gear.

The Collingwood Dry Dock & Ship Building Co. has launched the steamer Germanic, building for the Northern Navigation Co. This vessel is 190 feet over all, 32 feet beam and 12½ feet depth of hold. Her draught is 11 feet. She is fitted with steeple compound engines. Accommodations will be provided for 200 passengers. The vessel is fitted with steam steering gear and all modern improvements and will be lighted by electricity.

John R. Johnson of Portland, Ore., has secured a contract for the construction of two additional vessels. One is a tug for the Columbia Mills at Knappton, Ore., and will be 75 feet in length, 17 feet beam and 7 feet depth of hold. She will be fitted with Wells balance valve engines. The other vessel will be a stern-wheeler, 118 feet in length and 23 feet beam and is to be built for Capt. Hill to replace his steamer Governor Newell.

Bids submitted for the construction of relief light vessel No. 72, for which the Fore River Engine Co. of Weymouth, Mass., secured the contract, are as follows: Fore River Engine Co., Weymouth, Mass., $78,000, accepted; R. M. Spedden Co., Baltimore, $79,438; Townsend & Downey, New York City, $79,500; the Columbian Iron Works & Dry Dock Co., Baltimore, $87,200; Lewis Nixon, Elizabeth, N. J., $89,710.

A double launch was a recent occurrence at the yard of the Jackson & Sharp Co., Wilmington, Del. The vessels which went into the water were a dredge scow for the Du Bois Bros. Dredging Co. of New York, and a derrick lighter for the Pennsylvania Railroad Co. The former is 110 feet in length, 34 feet beam and 12 feet depth, and the latter is 82 feet long, 28 feet beam and 9 feet 4 inches depth.

Bids submitted to Robert McGregor, United States engineer at Little Rock, Ark., for the construction of a steel snag boat and one steel hull are as follows: Thomas M. Rees, Pittsburg, Pa., $66,500; Ed. J. Howard, Jeffersonville, Ind., $57,000; Iowa Iron Works, Dubuque, Iowa, $54,750; M. A. Sweeney Ship Yard & Foundry Co., Jeffersonville, Ind., $51,448.

Capt. R. M. Boyd of Pittsburg, announces that the company which was organized some time ago to build a large side-wheel steamer for the Pittsburg excursion trade will within a few days let the contract for the construction of the vessel. The boat is expected to cost in the neighborhood of $50,000 and be ready to go into service early next spring.

H. M. Bean of Camden, Me., has secured a contract for the construction of another five-master schooner, similar in size to the John B. Prescott. The new vessel is for Capt. John G. Crowley of Taunton, Mass., and others, owners of the Prescott and also of the six-masted schooner now building at the Bean yard.

A new river steamer was recently launched from the yards of the Pacific Improvement Co. at West Oakland, Cal. The steamer, which has not as yet been named, is 175 feet in length, 45 feet beam, 6 feet depth and 4 feet draught with a cargo of 300 tons. The vessel is designed for service on the Sacramento river.

Thomas & Urpman of Wheeling, W. Va., who operate the steamer Leroy between Wheeling and Clarington, will in the near future let a contract for a new steamer for river service. She will be 165 feet in length and 34 feet beam, and will be fitted with engines of 16 inches cylinder diameter and 7 feet stroke.

The name California has been chosen for the steamer building at the yard of the Union Iron Works, San Francisco, for the American-Hawaiian Steamship Co. The vessel will be 451 feet in length, 51 feet beam and of 8,250 tons carrying capacity.

Hugh Ramsey announces that a syndicate is figuring for the purchase of his works at Perth Amboy, N. J., with a view to establishing a large plant for the construction of steel ships. The property has a water frontage of more than 400 feet.

The handsome steam yacht recently completed for Mr. Hester, proprietor of the Brooklyn Eagle, by the Pusey & Jones Co. of Wilmington, Del., is named the Willada, instead of Illada as stated in a recent number of the Review.

Work is being hurried on the United States torpedo boat Stringham, building at the yard of the Harlan & Hollingsworth Co., Wilmington, Del., and it is expected she will be ready for her trial the latter part of September.

F. W. Wheeler of West Bay City, Mich., has launched the steel lumber carrying vessel building for the Spalding Lumber Co. of Chicago. A full description of the vessel will be found elsewhere in this issue.

The M. A. Sweeney Ship Yard & Foundry Co. of Jeffersonville, Ind., has secured from the United States government a contract for the construction of a $28,000 snag boat for use on the Arkansas river.

Ship building at Essex, Mass., is active. A. D. Story has just launched the schooner building for Fred L. Davis, and James & Tarr will build a 125-ton vessel for Capt. Jerome McDonald.

SEAMLESS BRASS AND COPPER TUBE INDUSTRY.

Randolph-Clowes Co. is the name of a corporation that has just taken over the business of Randolph & Clowes, well-known manufacturers of seamless brass, copper and aluminum tubing at Waterbury, Conn. With a commodious and well-equippe l plant, and with other facilities unequaled in the particular line that has been its specialty, this reorganized concern is certain to take even higher rank than in the past, not alone in this country, but in other parts of the world. The reorganization has been effected on a very conservative basis. The capital is $500,000 of 7 per cent cumulative preferred stock and $400,000 of common stock, and there is no water in it, as the assets of Randolph & Clowes over liabilities were very much in excess of $900,000. Had the principals seen fit to follow the practice heard of in a great many reorganizations that have taken place of late, they could readily have gone up to $2,500,000 or $3,000,000 capital, but it is not a reorganization of the sell-out kind, as it is announced that the active responsibility will devolve upon the treasurer and general manager of the corporation, Mr. Geo. H. Clowes, in the future as in the past, and he will devote his entire energies to the further development of the industry. Directors of the new company are Geo. H. Clowes, Chauncey P. Goss, Charles Miller and Franklin L. Curtiss of Waterbury, Conn., O. W. F. Randolph and Lyman Warren of New York, and Judge E. C. Bates of Boston, attorney for Mr. Clowes.

In the manufacture of seamless brass, copper and aluminum tubing, the Randolph-Clowes Co. surpasses all concerns of its kind, not only in this country but in Europe, as its product in seamless tubes is up to 38 inches in diameter, whereas the largest tubes made commercially in Europe are only 12 to 14 inches, and in this country until quite recently, excepting those manufactured at Waterbury, the largest tubes have been only up to 8 inches. One company recently fitted up its works for manufacturing tubing up to 9½ inches. With this exception, only one or two companies make as large tubing as 8 inches, and the balance not larger than 4½ inches. In the manufacture of tubes over 8 inches in diameter, or even above 5 inches diameter, there have been a great many problems to solve. The expenditure of large amounts of money, the development of very expensive machinery, and devotion for years to hard work by men experienced in the business have all been required to overcome the difficulties.

JAPAN PAINTS.

A circular recently received from John Mair & Sons, 136 South Delaware avenue, Philadelphia, says: "The purpose of paint is two-fold—preservation and decoration. As preservatives, paint and varnish have hitherto failed in achieving the object aimed at, mainly, through their non-possession of the quality of elasticity, and the action of the atmosphere on their rough surface. Varnish made with gums begins to deteriorate from the moment of its application. As a decorative, paint, for reasons already given, soon ceases to justify the expense and labor of applying it, as under the action of the atmosphere, the object on which it is applied rapidly becomes less and less the thing of beauty it was intended to be. After a series of experiments extending over a long period, a complete paint varnish has been produced that is free from the defects we have alluded to, and is capable of incorporation with the most delicate shades, without affecting the color, as it possesses the requisite elasticity by which the contraction and expansion of metals is accommodated. There is absolute smoothness of surface, thus preventing the lodgment of corroding acids and the multiplication of bacteria. Other advantages of varnish paint are the most perfect brilliancy obtainable (lasting in effect), great durability and capacity for being cleansed. Mair's paint, for which these claims are made, will produce a better effect and have greater durability than any other material now in use. It is slightly heavier in the working than ordinary paints, but this is more than compensated for, and a large balance is left in saving of time and material. It is especially adapted for use on board ship, on both metal and wood work."

ITEMS OF INTEREST.

The report of the board of naval officers which had under consideration the circumstances of the recent collision of the dispatch boat Dolphin with the ferry boat New York in the East river, New York, says that the collision was due to an inefficient lookout on the part of the pilot of the New York and to his vacillating course of action after sighting the Dolphin. It is further stated that all proper means were adopted by the Dolphin to avoid collision and that no one on board that vessel is in any way culpable. The Dolphin goes to the Boston navy yard for repairs, which will be slight, requiring an expenditure of not more than $1,200.

Two prominent Russian railway officials now in this country are authority for the statement that either Seattle or San Francisco will, within the next few years, be made the terminus of a new Trans-Pacific steamship line to connect with the Trans-Siberian railroad.

A new submarine vessel bearing the name La France was recently tested at Cherbourg. The trial was eminently successful, the vessel descending three times to a depth of 100 feet and remaining submerged each time for more than an hour.

The launch of the 30-knot torpedo boat Bailey, building at the works of the Gas Engine & Power Co. and Seabury & Co., Consolidated, Morris Heights, New York City, has been set for August 21.

The Holland Torpedo Boat Co. has filed a certificate of the reduction of its capital stock from $1,000,000 to $50,000. The amount of the company's debts and liabilities is $20,000.

The navy department has decided to sell the supply ship Culgoa, which was purchased at Hong Kong by Admiral Dewey just prior to the beginning of the Spanish-American war.

The weekly statement of the bureau of navigation, treasury department, lists the steamer Douglas Houghton, recently launched at Cleveland, as of 5,332 gross or 4,034 net tons.

It is expected that the White Star line steamer Oceanic, the largest vessel in the world, will sail from Liverpool for New York on her maiden voyage on Sept. 5.

TRADE NOTES.

A shipment of 30,000 pounds of seamless drawn condenser tubes was made to Glasgow, Scotland, recently, by Merchant & Co. of Philadelphia.

The New Doty Manufacturing Co., Janesville, Wis., write that although their plant is being operated to its fullest capacity there is no probability that they will be enabled to catch up with orders for some time to come.

After having for twelve years occupied the position of western manager of the American Steam Gauge Co. of Boston, Mr. J. L. Weeks has been elected to the office of treasurer of that company and made general manager.

The Pittsburg Machine Tool Co., lately incorporated with Frank Moore of the Pittsburg Malleable Iron Co. as president, has completed a new building at Darrah and Rebecca streets, Allegheny, and is rapidly installing machinery. The plant will be ready for operation about Sept. 1.

The Pneumatic Crane Co. has thoroughly overhauled the plant formerly occupied by the Westinghouse Machine Co. at Twenty-sixth street and Liberty avenue, Pittsburg, and will be ready in a few days to begin the manufacture of a new design of crane, to be operated by compressed air.

A preparation is being manufactured by the Fabric Fireproofine Co., 26 E. Twenty-third street, New York, which, it is claimed, will render clothing, carpets, bedding and all other fabrics absolutely fire proof without injury to either fabric or color. Wash-clothes are treated by simply mixing a small amount of "Fireproofine" with the starch, or by dipping them into the solution after they have been washed. "Fireproofine" is meeting with a rapid sale, and will no doubt come to be used very extensively on board ship.

Some convincing arguments in favor of acetylene gas as an illuminant are advanced in a sixty-page catalogue recently issued by J. B. Colt & Co., Nos. 3-7 West Twenty-ninth street, New York, who are manufacturers of the Criterion automatic acetylene gas generators. The book is illustrated with a large number of half-tone cuts of public institutions and private residences in which the Criterion generators are used. Plans of the different sizes and models of the generator are also given. The long list of users of the Criterion generator should go a great way towards removing the prejudice that still exists in the minds of some people against the use of acetylene gas.

The Babcock & Wilcox Co. has sold to the Manhattan Elevated Railway Co. of New York City, the boilers required for its new electric generating plant, which will furnish electric current for operating its entire elevated railway system in New York City. The boiler equipment will consist of sixty-four 520-horse power Babcock & Wilcox all wrought steel boilers, capable of carrying a working pressure of 200 pounds per square inch. The boilers will be fitted with Roney automatic stokers, manufactured by Westinghouse, Church, Kerr & Co. This is the largest single order ever placed for stationary boilers.

The tug Vigilant, building at the Crescent Ship Yard of Lewis Nixon, Elizabethport, N. J., for Lieut. Com. John C. Fremont, supervisor of New York harbor, is 112½ feet over all, 98 feet water line, 22 feet beam, 13 feet depth and 8 feet draught. She will be fitted with Wells' quadruple expansion engines of 700 horse power and a Roberts water tube boiler. The New York supervisor's fleet, including the Vigilant, now numbers seven vessels, six of which are equipped with Roberts boilers. The continued use of Roberts boilers in this fleet after a number of years' experience is certainly a strong recommendation.

In a report dealing with comparative tests of sheaves, made some time ago by order of the bureau of construction, Naval Constructor F. T. Bowles, now in charge of the Brooklyn navy yard, says the tests showed that the Parkin ball bearing bushing was superior in simplicity, durability and ease of working to the bushing then in government use. He was also of the opinion that, although the first cost of the bronze sheave of the Parkin bushing was greater than that of cast iron sheaves, the bronze sheaves were more economical. The Parkin Ball Bearing sheaves are manufactured by the Pennsylvania Block Co., Seventh and Cherry streets, Philadelphia.

A new catalogue, dealing with "Smooth-On" compound, a material for repairing metal breaks and fractures of all kinds, and which is now being supplied in large quantities to the United States navy department, has just been issued by the Smooth-On Mnfg. Co., Vreeland Tompkins manager, No. 551 Communipaw avenue, Jersey City, N. J. Copies of the catalogue will be furnished upon application.

The popularity of water tube boilers of the type manufactured by the Stirling Co. of Chicago, appears to be increasing at a rapid rate. On July 1 the contracts on hand exceeded by 400 per cent those on hand at that time the year previous and by 1,000 per cent the contracts on the books July 1, 1897. The contracts secured during the first six months of this year exceeded three times over those received during the corresponding period in 1898. In the marine department the contracts on hand will keep the company's enlarged plant busy night and day for a year.

The electric automatic whistle operator, manufactured by the Signal & Control Co., No. 27 West street, New York, is an invention which, when applied to a steam whistle, places the whistle under absolute control, so that the blasts will be repeated automatically at regular intervals, or at the will of the operator. It removes any chance of error in signals by regulating both the length and number of blasts. The operator is so arranged that the whistle may be operated from any number of points on shipboard. It is not a new device, having been in operation a number of years on ocean vessels. It is now used on twenty-seven vessels of the United States navy, thirty-eight United States revenue, cutters and lighthouse tenders, on the United States army transports, and on nearly all the ships of the Hamburg-American, North-German Lloyd, White Star, American and Red Star lines, and in fact nearly all the Atlantic liners, as well as a large number of coasting vessels. On the great lakes the operator is used on board the Northwest and Northland, elegant passenger steamers of the Northern line.

WORK OF THE DEEP WATERWAYS COMMISSION.

The daily newspapers seem to keep close watch of the movements of members of the United States Board of Engineers on Deep Waterways, although it is not probable that the plans and estimates of the engineers regarding ship-canal routes from the great lakes to the Atlantic seaboard will be ready before December next, when plans will also be submitted for the proposed dam in Niagara river for the regulation of Lake Erie. Lieut. Col. Chas. W. Raymond of the army engineer corps, and Mr. George Y. Wisner of Detroit, members of the board, visited Sault Ste Marie last week for the purpose of securing data on which to base estimates of the cost of constructing a new and larger lock at the Sault with a depth of 30 feet, and of deepening portions of the St. Mary's river. These estimates are involved in the duties of the commission, for the reason that it is proposed to submit a report dealing with a 30-foot channel throughout the lakes in connection with a proposed ship canal route of similar depth to the seaboard. Mr. Wisner is quoted as saying, upon returning from the Sault, that there is no question as to the practicability of constructing the proposed Atlantic connection with a depth of either 20 or 30 feet and with ample supply of water. It will rest with congress, Mr. Wisner said, as to whether the requirements of commerce between the northwest and the Atlantic will justify the expenditure. He would hazard no opinion yet as to the probable cost of a channel, either by way of the Oswego-Mohawk or the St. Lawrence-Champlain route. The commission's estimates will be for channels of 21 and 30 feet depth, and will include the features of deepening the rivers connecting the great lakes, where necessary, in connection with the general scheme. The general question of regulation of lake levels must also be taken into consideration. Two surveys have been made to connect Lakes Erie and Ontario, both on the American side of Niagara river, the utilization of the present Welland canal on the Canadian side not being contemplated, since a new canal could be more cheaply constructed around the Niagara. It is expected that Mr. Wisner and Col. Raymond will formulate the details of the report, which will be reviewed and subscribed to also by the third member of the board, Mr. Noble of Chicago, who is now engaged on preparatory work regarding the isthmian canal project. The board is not to make recommendations, but will report upon the situation and submit estimates of the cost of the waterways.

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AROUND THE GREAT LAKES.

Charles P. Gilchrist of Cleveland has purchased from Capt. Thomas Murphy the schooner R. Hallaran, one of the vessels chartered by the Atlantic Transportation Co. last autumn, and which was held up in the St. Lawrence river. She will tow with one of the steamers of the Gilchrist fleet.

The steamer Malietoa, building for the Minnesota Steamship Co., and which is expected to break all existing cargo records on the great lakes, was launched on Saturday last at the yard of the American Ship Building Co. at Lorain, O. The vessel is 474 feet over all, 454 feet keel, 50 feet beam and 29 feet depth of hold. Her quadruple expansion engines have cylinders of 15¾, 25½, 38 and 57 inches diameter and 40 inches stroke. Steam will be supplied from Babcock & Wilcox water tube boilers.

On behalf of the citizens of Houghton, Mich., Hon. C. D. Shelden a few days ago presented to the new Rockefeller steamer Douglas Houghton an elegant United States flag. The citizens of Houghton proposed to present to the new vessel a full set of colors, but these had already been provided and the large flag was accepted with equal appreciation by Mr. L. M. Bowers of the Bessemer Steamship Co., representing the company. Douglas Hough n for whom the new steamer is named, was one of the pioneers in the development of the Lake Superior copper region.

The steamer H. C. Frick, building for the Cleveland Steamship Co. (John Mitchell and others), was launched at the Globe yard of the American Ship Building Co., Cleveland, last Saturday. The new vessel is 6 feet longer than the M. A. Hanna, owned by the same company. She is 436 feet over all, 416 feet keel, 50 feet beam and 28½ feet in depth, and is fitted with triple expansion engines, having cylinders of 23, 37½ and 63 inches diameter and 42 inches stroke, to which steam will be supplied from three Scotch boilers. The Frick will carry 6,000 tons of ore on an 18 feet draught.

W. H. Morgan, president of the Morgan Engineering Co., of Alliance, O., will leave for Europe Aug. 16, to establish foreign offices in the leading cities of England, Belgium, Germany, France and Russia, with headquarters at Brussels. Frank Carter, who has been in Europe several months in the firm's interests, will have charge of the main office.

Niagara Falls Excursion via the Nickel Plate road on Saturday, Aug. 19. Train leaves Cleveland 11:15 p. m. Tickets good returning on any one of our peerless trio of daily express trains. For rates and further particulars see agents. 112, Aug. 19

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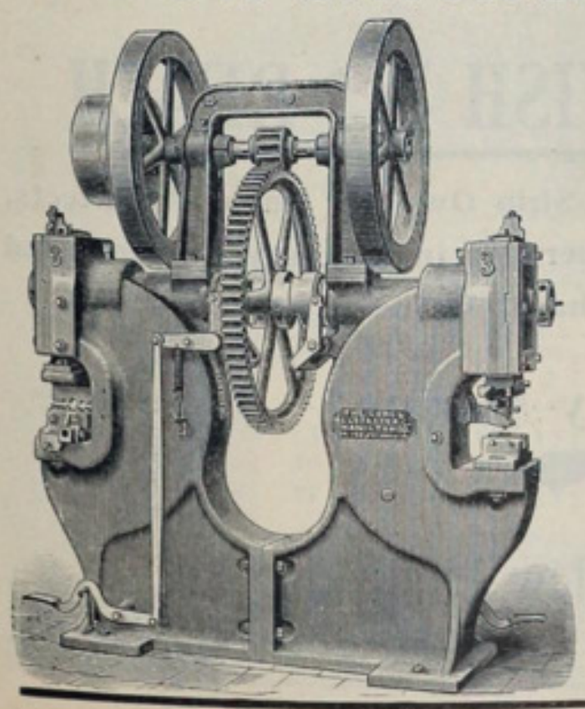

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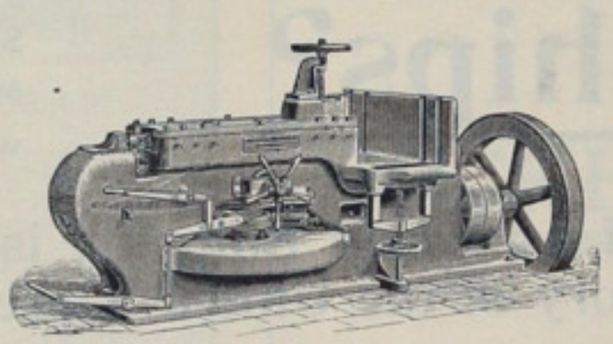

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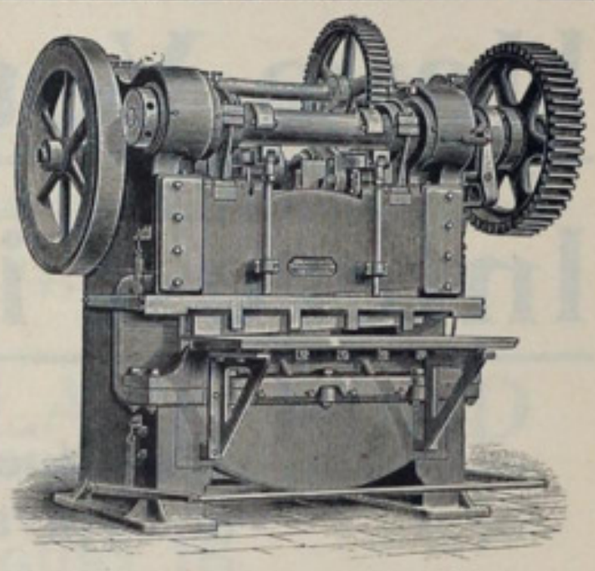

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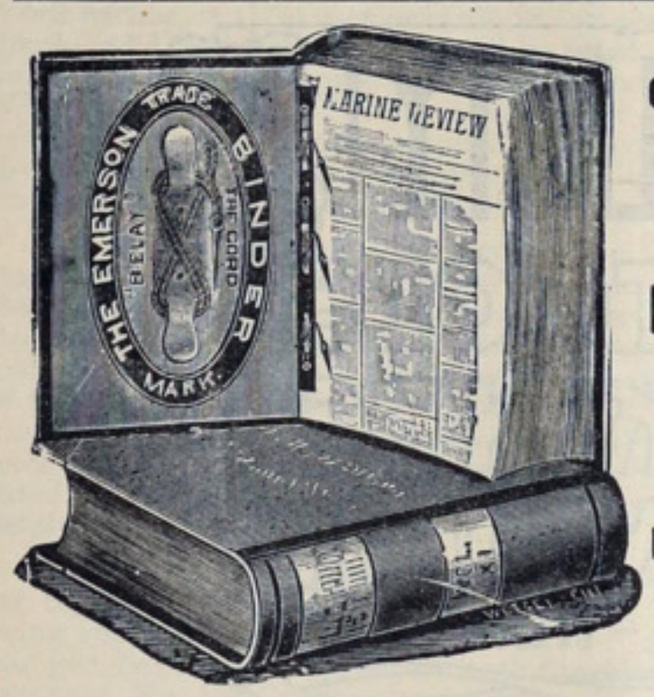

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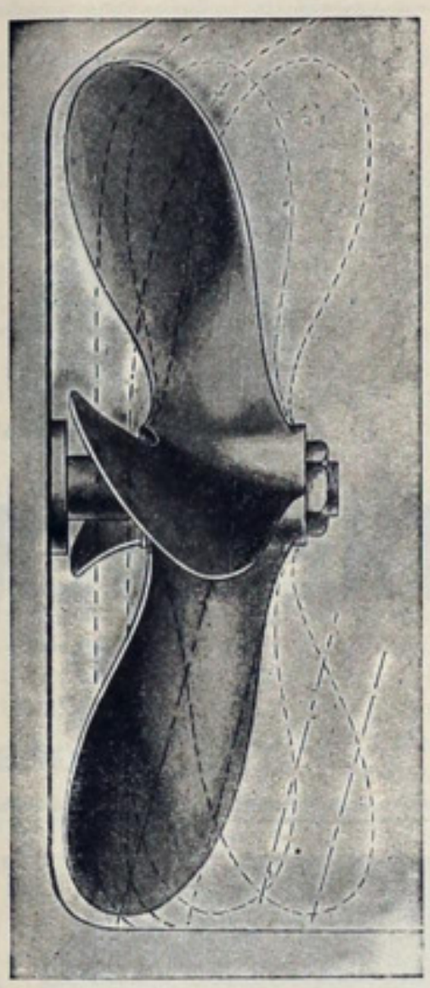

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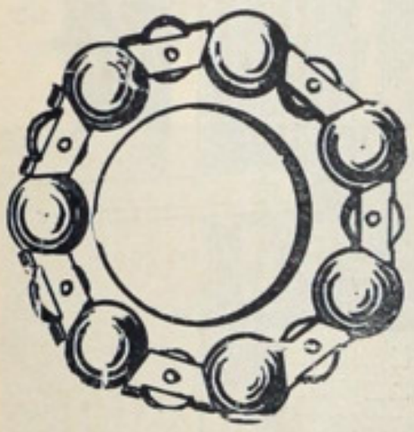

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U. S. Engineer Office, 57 Park St., Grand Rapids, Mich., July 14, 1899. Sealed proposals for Hydraulic Dredge will be received here until 3 p. m. August 28, 1899, and then publicly opened. Information furnished on application. Chester Harding, Captain, Engrs. Aug. 10.

Excursion to Niagara Falls

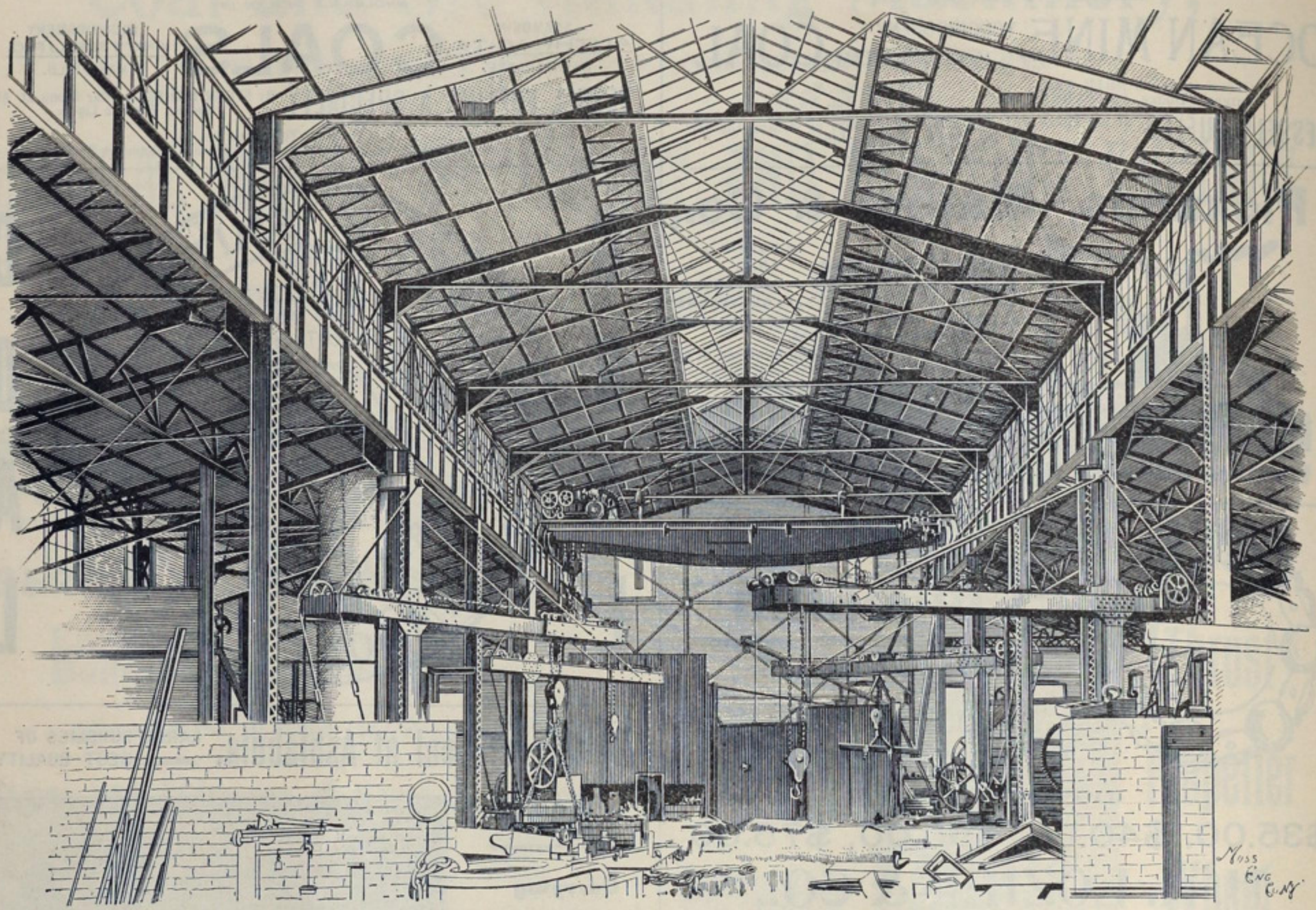
VIA THE

NICKEL PLATE ROAD

ON AUGUST 15.

In connection with this, tickets sold from Falls to Montreal for $9.50 extra. Liberal limit. Secure sleeping car space early. Ask Agents. 105, Aug. 10.

THE BERLIN IRON BRIDGE CO., Engineers, Architects and Builders of Steel Structures



The above illustration is taken from a photograph and shows the interior of a Foundry Building which was designed and built complete by us for S. F. Hodge & Co. at Detroit, Mich. Each wing is 24 ft. in width, and the central portion is 40 ft. in width; this latter controlled by a crane with a travel the full length of the building. The crane girder posts are designed to carry jib cranes as shown. The roof is covered with our Patent Anti-condensation Corrugated Iron. The building is absolutely fire-proof, and the corrugated iron is guaranteed not to drip during the coldest weather.

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